The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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A Remarkable Substance

THERE are many reasons why helium is a remarkable substance, but in its behaviour in the neighbourhood of absolute zero it is perhaps to be regarded as the most bizarre of all elements. We are becoming accustomed to regard this narrow temperature range as a condition in which strange events can occur, such as the electric current which may flow for ever, but the discoveries related by Professor Cockcroft in a Royal Institution lecture seem to suggest that in liquid helium we have the most remarkable example of all.

Helium exists in the liquefied form in two modifications, which have been named helium I and helium II. It liquefies at 4.2 deg. Abs. and between then and 2.2 deg. Abs. it behaves like a normal liquid. At 2.2 deg. helium I inverts into helium II, changing its properties completely, a change possibly due to the appearance of order in some measure in what had previously been the disordered molecules of a normal liquid. The peculiarities of the second modification are known at present to be shown in three ways: thermal conductivity, viscosity, and ability to flow spontaneously over boundary surfaces in thin films.

Helium II conducts heat two hundred times better than any known substance. The best metals conduct heat about a thousand times better than materials commonly described as "insulating," but this is largely due to the difference in structure of the substances whereby the path available for heat flow is diminished. A better comparison is that the thermal conductivity of iron is some four hundred or five hundred times better than that of a real non-conductor such as coal or lime or magnesite; here we have a material a good deal more than two hundred times better in this respect even than iron. No temperature difference can be detected between the opposite faces of a thin layer of helium II through which heat is passed in the usual manner adopted for measurement of thermal conductivity of liquids. It is necessary to allow the heat to pass through a long cylinder of the liquid helium contained in a capillary tube for any measurable temperature difference to be obtained. Exceedingly accurate methods sensitive to 15^{-5} deg. C. have been devised to measure this temperature difference, and hence the conductivity of helium II. It is found that whereas a little heat is conducted extremely well, with larger heat flow the conductivity diminishes. A very remarkable fact is that the flow of heat down a tube of liquid helium is associated with momentum, some of which is transferred to the walls of the vessel; no other instance is known of heat flow being associated with momentum.

The viscosity of helium II is so low that it is no less than one million times more fluid than any other known substance. By packing a thousand stainless steel wires in a German-silver tube and extruding the whole through dies, capillary spaces have been obtained 10^{-5} cm. in diameter. Under a pressure of 100 dynes per sq. cm., helium II flows through these capillaries at the rate of 20 cm. per second, whereas hydrogen gas, the least viscous substance known, only flows at the rate of 10^{-3} cm. per second. The velocity of flow of helium II decreases with decrease in temperature.

The peculiarity of flow over surface in thin films was first observed by noting that if a tube is placed in a reservoir of liquid helium II, it begins to fill with helium just as if there were a small hole in the tube. Similarly a tube containing helium II drips helium as if it were leaking out. It has been found that when copper wires are placed connecting the helium inside and outside the tube, the rate at which the levels become coincident increases in proportion to the surface of the connecting wires. Hence it is concluded that surfaces in contact with helium II become coated with a thin film of liquid moving with appreciable velocities. This film has a thickness of 4 to 10^{-6} cm. and at 1.5 deg. Abs. moves at a rate of 0.75 by 10^{-4} ml. per second per cm. width of surface. This mobile surface film evidently prevents the normal retardation of flow through a capillary due to the drag on the central core of the stationary film at the sides. It may also serve to explain the high thermal conductivity, since the heat is carried by mass transport and the conductivity would therefore be determined by the specific heat of the liquid, as indeed it is.

The basic cause of these peculiarities can be explained if an explanation can be found for the surface film phenomena. It has been shown that they are not due to the formation of a crystalline liquid. Einstein has shown that at a critical value, later discovered to be 2.2 deg. Abs., some atoms must condense to a state of zero energy. If condensation takes place more readily near the walls of the vessel, the surface film has a high density of condensed atoms. Some of these condensed atoms near the wall would thus evaporate, absorbing heat and allowing others to flow in, against the direction of heat flow, to take their place. It seems a very short while since Rayleigh discovered helium; it is an even shorter period since a technique was discovered by which helium could be liquefied; now we use it as a normal substance for experiment. Thus does science make rapid strides; and who can foretell what will be the next practical application of this curious substance?

CONTENTS

A Remarkable Substance	297
Notes and Comments	298
Research in Germany To-day—New Addition Products of Diphenols—Low Temperature Carbonisation—Narrow Brick Retorts	
Textile Applications of the Phosphates	299-300
Large-scale Hydrogenation Research	300
Association of British Chemical Manufacturers	301-2-3
Letters to the Editor	304
Chemical Research Council	305
A Chemist's Bookshelf	306
Personal Notes	306
General News from Week to Week—Foreign News	307
Inventions in the Chemical Industry	308-9
Weekly Prices of British Chemical Products	310-11
Commercial Intelligence—Stocks & Shares	312

NOTES AND COMMENTS

Research in Germany To-day

SIGNIFICANT words were spoken by Sir Thomas Holland, Principal and Vice-Chancellor of Edinburgh University, at a graduation ceremony in Edinburgh, when, speaking from " personal and direct evidence," he said that " six or seven years ago no scientific man in the world would have dared to pass over the publications of the research institutes of Germany. Not only were they great in volume, but their quality was of the kind that led the world. To-day, those volumes of output from the research laboratories have diminished to a small fragment of their former size and the quality of the residue is negligible." He pointed out that the neglect of fundamental research in science and of the search of truth for its own sake must be followed by degeneration in technical efficiency, military efficiency included. Two years ago, he stated, on the books of the Society for the Protection of Science and Learning were 1,400 names of men who had been turned out of the Universities of Germany, partly because of the accident of race and partly because they would not conform to the new regime. The residue at German Universities had been hypnotised into slavery by an incessant stream of untruths. Only the very youngest in that room would live to see the German Universities restored to their old position in the intellectual world.

New Addition Products of Diphenols

IN a note to the Academy of Sciences, Yvonne Carreau suggests a new group of addition products of diphenols. She recalls that hydroquinone and resorcin can form such products with the hydroxides or sulphites of certain bivalent metals, and ethylene diamine. Further study has shown certain other possibilities. The method of preparation used in each case was the same. A solution containing ethylene diamine to the extent of 3.2 mol./g. per litre and metallic halogenides to the extent of 1.2 mol./g. per litre, agitated by a current of nitrogen bubbling through it, is mixed with 0.9 mol./g. of diphenol. After several hours rest in an atmosphere of nitrogen, the crystals formed are filtered, washed and dried out of contact with the air. The results obtained with hydroquinone are as follows: with copper, zinc and cadmium chlorides and with zinc bromide, addition products could be isolated. They have the same formulæ as those obtained with the corresponding sulphites, already known. This is, generally, $3(C_6H_6O)_2$. $2(CH_2NH_2)_2$. M (M=Cu. Zn. Cd.). Nickel chloride and bromide provide a combination of the same type as that obtained, but the sulphite gives a product containing SO_2. Calcium chloride and cobalt chloride and bromide give combinations of the same type, with a different number of molecules of water. These three new addition products of hydroquinone containing calcium, nickel and cobalt are all similar in composition, and have a similar crystalline aspect. The colour varies with the metal, being colourless for calcium, violet for nickel, and rose for cobalt. The product formed with zinc iodide is precipitated in the form of colourless plates. It corresponds to the formulæ $3(C_6H_6O_2)$. $2(CH_2NH_2)_2$. Zn $(OH)_2+3(CH_2NH_2)_2$. Zn I_2+3H_2O. In the only combination with resorcin which could be obtained, triethylene diamine iodide of zinc was found.

Low Temperature Carbonisation

AN important part of the work on the carbonisation of coal at "low temperatures " has been the design and development at the Fuel Research Station of a type of retort suitable for the production of a free-burning smokeless fuel that could be used in place of the large amounts of raw coal now burned in domestic grates, and at the same time providing an additional source of liquid fuels. A paper now published by the Department of Scientific and Industrial Research, entitled *Fuel Research Technical Paper No. 50: Narrow Brick Retorts at the Fuel Research Station, Part II* (H.M. Stationery Office, 1s.), marks the end of a definite stage in this work, and supplements the previous issued reports. " It is felt," the report states, " that the development of these retorts has proceeded as far as is possible in an experimental establishment, and the present report places on record an account of the experience gained and of certain details of operation." Originally the retorts used were made of cast iron, but distortion rendered them unworkable after about two years. It was therefore decided, while using the same general design, to build the retorts of firebrick. A setting of two brick retorts was erected in 1932, and then they have been operated over a considerable range of temperatures, and have shown very little deterioration.

Narrow Brick Retorts

IN the report now published the design described and illustrated embodies certain improvements resulting from experience with the original firebrick setting. A description of the method of the operation of the retorts deals particularly with control of throughput and the manipulation of temperature. The method of heating adopted makes possible a wide variation in the distribution or zoning of temperatures over the length of the retort, and is an important feature of the design. This control of temperature zoning, with suitable adjustment of the throughput, imparts a high degree of flexibility to the retorts, which is shown by the fact that they have carbonised 57 different coals, ranging in type from non-caking to strongly-caking and in size from nut coal to slack. Results are given for 30 experiments in these retorts, including analyses and carbonisation assays of the coal, carbonising data, yields of products, and combustibilities of the cokes in open domestic grates.

Textile Applications of the Phosphates

Laundry Uses for Trisodium Phosphate

By
G. S. RANSHAW

PHOSPHORIC acid (H_3PO_4), being tribasic, can form three series of salts according to the number of hydrogen atoms substituted by a metal. Where sodium replaces hydrogen the following salts are known: Monosodium phosphate, $NaH_2PO_4.2H_2O$; disodium phosphate, $Na_2HPO_4.12H_2O$; trisodium phosphate, $Na_3PO_4.12H_2O$.

In addition there is sodium metaphosphate, a commercial product obtained by the dehydration of monosodium phosphate and having the formula $NaPO_3$. This salt exists in the form of the tri-, tetra- and hexametaphosphates. Finally, disodium phosphate, too, can be dehydrated giving the pyrophosphate with formula $Na_4P_2O_7$.

Practically all these salts of phosphoric acid have their uses in the textile trade and, latterly, in laundry practice, the more important ones being disodium phosphate, trisodium phosphate and sodium metaphosphate. The former finds its chief application in the technique of silk weighting, whilst trisodium phosphate has been found to have useful properties where the purification of boiler feed waters is concerned, there being some recent developments in this connection. It is also finding use in the bleaching trade on account of its detergent action and alkalinity. These are put to profit in the preliminary alkali boil when cotton and linen fibres are in question.

Phosphates in Bleaching

The most important use of phosphates, indeed, is in bleaching, several commercial compounds having been developed to combat the formation of lime soaps, since the latter are solubilised by sodium metaphosphate (Calgon); they have, however, a growing importance as stabilising agents in the peroxide baths employed in wool (and occasionally cotton and staple fibre) bleaching, being superior to the sodium silicate formerly used in large quantities.

This operation, which consists of treating the raw linen yarn or fabrics with a hot alkaline solution, has for its object the removal of gums and pectic substances so as to render the fibres capable of absorbing dyestuffs uniformly and levelly. According to the quality of the linen, and according to the treatments that it may subsequently have to undergo, a large or a small loss in fibre weight is desirable, and it is above all in cases where a *small* loss in weight is desired that trisodium phosphate is interesting.

The usual agents employed are caustic soda and sodium carbonate. Caustic soda has a strong action on the resins and splits the fats, but if the action is too strong the cellulose itself is attacked. Sodium carbonate has a milder action and its power of removing certain impurities is small. In associating trisodium phosphate with these two products it is possible to profit from the advantages of each, without their inconveniences. Thanks to the presence of the trisodium phosphate, the non-saponifiable fats are easily emulsified and, with a liquor of moderate alkalinity, the incrustations and impurities on the fabrics or fibres are perfectly dissolved. Beyond this there is the assurance that neither iron nor lime salts will be deposited on the fibres.

As an example, here are the weights which were applied on a large scale in a modern factory and which are reported in a recent issue of the Bulletin of the *Société Industrielle de Rouen* as giving excellent results. The goods consisted of linen yarns destined to be hank dyed. The baths originally employed consisted of 1 per cent. caustic soda and 6 per cent. sodium carbonate. These were replaced by baths containing 1 per cent. trisodium phosphate and 5 per cent. sodium carbonate, without caustic soda. The latter recipe is a little more economical than the former. The mode of operation remains unchanged and the length of the boil is the same. The yarns treated with the trisodium phosphate were at least as creamy as the others, whilst the average loss in weight was 9.6 for the yarns treated with trisodium phosphate, against 13.7 per cent. for those treated with soda and carbonate. The loss in strength of the yarn treated by the latter method was 10 per cent. greater than when treated with trisodium phosphate without caustic soda.

The above, of course, relates to a case where a minimum loss in weight was desired: to obtain a greater stripping effect baths of the following composition were used: 2 per cent. of caustic soda, 1 per cent. trisodium phosphate, and 2 per cent. sodium carbonate, diluted 1/4.5. A formula of this type is not more expensive than one without trisodium phosphate, and yarns of good strength and purity, which take colour well, are said to be obtained.

The alkali boil on cotton is usually carried out in a liquor containing sodium carbonate and Turkey red or other sulphonated oil. Data published recently reveal that a bath consisting of 5 per cent. sodium carbonate and 2 per cent. sulphonated oil can be replaced by one containing 4 per cent. trisodium phosphate, the oil being dispensed with. Operating conditions remain unchanged and a very good result is obtained, the cotton absorbing dyestuff uniformly.

In cases where sodium carbonate and caustic soda are used, the formula of replacement by trisodium phosphate giving the best results is based on the following principles: (1) distinct reduction of the amount of caustic soda used; (2) equally important diminution of sodium carbonate; (3) replacement of the weight of the two suppressed by a weight of trisodium phosphate some 25 per cent. less. Vegetable fibres that have been boiled with trisodium phosphate take up dyestuff more uniformly, moiré effects being rare and consumption of dyestuff being more economical; so much so that it is sometimes an advantage to pass a yarn or fabric which has received the usual alkali boil through a final trisodium phosphate bath with the sole object of facilitating dyestuff absorption.

Wool Washing

The washing of wool is also facilitated and improved results are obtained by employing trisodium phosphate. In such a case it is not, as in linen boiling, a matter of the presence of acids which it is necessary to neutralise. Washing, and the alkaline treatment of wool, have solely the object of eliminating the oleine and fatty materials which it contains. In these operations it is essential to avoid the use of too caustic alkalies and heat, which destroy the wool. The oily materials must also be eliminated *entirely*, or the residues which remain will eventually turn rancid and impart a disagreeable odour. Trisodium phosphate has proved perfectly suitable for all these purposes. It is much more active than sodium carbonate and the consumption is 3 to 4 times less, so that it is more economical.

In a number of cases it is possible to dispense with trichlorethylene where such has previously been used. A wool which has been treated with trisodium phosphate is perfectly de-greased and contains no matter which will subsequently ferment. No damage to the fibres is to be feared and the fabric remains particularly soft and open to the touch.

Trisodium phosphate is used also in bleaching wool with hydrogen peroxide (peroxide is also used sometimes in bleaching cotton and linen). To obtain satisfactory results it is necessary to add to the peroxide bath certain substances known as stabilisers. These permit of the regular evolution of the oxygen, and *regular* evolution permits the maximum use to be made of the oxygen available, so that bleaching action is better and more economical. The best stabiliser for

hydrogen peroxide is sodium *pyrophosphate*. In certain cases, instead of using the pyrophosphate alone, a mixture of equal parts of this and trisodium phosphate may be employed. The concentration of pyrophosphate necessary ranges from 1 to 3 grammes per litre of bleach bath (2-6 vols.) when wool is being treated.

Silk also is bleached with peroxide, and just as in the case of wool, pyrophosphate either alone or admixed with trisodium phosphate is used. Hotter and more concentrated baths, however, may be necessary, as silk is less sensitive than wool to alkaline action. Trisodium phosphate is likewise used in de-gumming natural silk and in de-sizing rayon (viscose). In both cases the scouring effect is very satisfactory, since the baths never attain an alkalinity detrimental to the fibres. Here, as in the other cases, trisodium phosphate replaces quantities of sodium carbonate or caustic soda 3 or 4 times as large. Where very delicate fabrics are being handled, sodium hexametaphosphate may be substituted for trisodium phosphate.

Silk weighting consumes important quantities of disodium phosphate. The heaviness, stiffness and consistency that fashion demands of certain silk fabrics cannot be obtained except by charging the silk with mineral substances precipitated on the fibre and, to some extent, entering into it. The material used to weight the silk is phosphate of tin. The desired effect is attained by passing the silk pieces through a succession of baths where chloride of tin and disodium phosphate are allowed to react. The tin phosphate so formed is precipitated on the fibre, adhering in an intimate manner to it, giving it weight and the desired stiffness. This very delicate operation consumes relatively large quantities of disodium phosphate.

Laundry work is another industry calling for the consumption of large quantities of trisodium phosphate, this being added to the mixture of soap and sodium carbonate forming the washing liquor. The trisodium phosphate may replace part or even the whole of the sodium carbonate, *e.g.*, a wash liquor consisting of 500 gr. soap and 2 kg. sodium carbonate may be replaced by one containing 250 gr. soap and 1 kg. trisodium phosphate. The use of trisodium phosphate necessitates no dislocation of the normal routine. Time of immersion, temperature, and number of rinsings remain the same.

A final word may be said of the action of trisodium phosphate in laundry work. This is explained in much the same way as its employment in the textile processes described above. By its emulsifying properties, wetting action, and protective action against the deposition of lime soaps it is able to dissolve a part of the incrustations, maintain the others in solution, and facilitate the penetration of the liquors into the fabric. Its activity is such that it permits of a reduction by half of the quantity of soap used, without losing any cleansing effect. Finally, in hard water it does not give rise to precipitates which may become fixed on the fibre; and therein lies its great advantage over sodium metasilicate.

Large-Scale Hydrogenation Research

Results Obtained in a Semi-Technical Scale Plant

PARTICULAR interest attaches at the present time to a Report* just issued by the Department of Scientific and Industrial Research, dealing with the hydrogenation process, which describes the results obtained in a semi-technical-scale plant at the Department's Fuel Research Station, where extensive investigations into the hydrogenation process have been in progress for a number of years. Earlier reports dealt with small-scale experiments examining the underlying principles of the process, and with the knowledge and experience so gained, it was logical to consider next the problems of production on a full industrial scale. It was realised that the design, operation, and results obtained might be considerably influenced by this increase in scale, and it was decided to build an intermediate-scale plant, large enough to indicate the differences to be expected in full-scale operation.

In the design of the larger plant a major difference lies in the method of heating the raw materials and maintaining the desired reaction temperature. Experiments with a small-scale internally-heated converter showed that the heat of reaction was nearly sufficient to heat the incoming raw materials to the reaction temperature, and this at once suggested a method of heating for the larger plant. The raw materials are raised to a temperature of about 300° C. by heat interchange with the products leaving the converter, and they then pass to a gas-fired coil (the pre-heater) where the temperature is brought to about 400° C. At this temperature they enter the converter, where the ensuing reactions cause a further rise to the desired reaction temperature, which in these experiments was normally about 500° C. The raw materials consist of hydrogen and low-temperature tar, to which is added a controlled proportion of "recycle oil." "Recycle oil" is the residue of the hydrogenation product after removal of the motor spirit by distillation. From a mixing tank the tar and oil are pumped at the required pressure, usually 200 atm., into a high-pressure pipe-line, where they are mixed with hydrogen at the same pressure and passed through the heat interchanger and preheater to the converter. The latter is a vertical cylinder of forged steel, 13 ft. long and 16 in. in internal diameter, with walls 3 in. thick. The reaction chamber, suspended concentrically within the converter, is 11 ft. long and 8 in. in internal diameter, with walls of 5/16 in. chrome-nickel steel. It is fitted with internal radial fins to assist the distribution of heat and of liquid raw material, and is filled with a granular catalyst consisting of molybdenum disulphide supported on alumina gel.

The products leaving the converter pass through the heat interchanger and a water-cooled condenser to a high-pressure separator, where the residual gas is removed. The liquid products are then released into a low-pressure separator, in which dissolved gas is evolved, while the oil is passed to a still for the removal of motor spirit by distillation. The oil remaining after distillation (usually boiling above 176° C.) forms the "recycle oil," which is stored in tanks for recirculation through the plant as part of the raw material. The residual gas leaving the high-pressure separator contains about 90 per cent. of hydrogen, and after scrubbing to remove the gaseous hydrocarbons it is recirculated through the converter.

Some difficulties in controlling the temperature were encountered in the first experiments, as the heat of reaction and the heat losses from the new plant were not precisely known. On a number of occasions excessive rises of temperature in the reaction vessel were recorded, and different expedients were adopted to overcome them. The most effective of these was to use a high proportion of hydrogen to tar in the raw materials supplied to the converter, so that by variation in the rate of hydrogen flow it became possible to maintain the reaction temperature within a few degrees of the desired level. The operation of the plant has been very satisfactory and has shown that the results of treating low-temperature tar are similar to those obtained in small-scale experimental plants. The reasons for such slight differences as have been observed are understood, and it has therefore been unnecessry to continue experimental work on a larger scale, for the results from the small-scale plants can now be readily translated into terms of full-scale operation.

* *Fuel Research Technical Paper No. 51 "The Hydrogenation Cracking of Tars"—Part V. The Operation of a Semi-Technical-Scale Plant.* (H.M. Stationery Office, 1/-).

Association of British Chemical Manufacturers

War-Time Problems—Export Trade Opportunities

THE 23rd annual general meeting of the Association of British Chemical Manufacturers was held in London on October 12, under the chairmanship, for the second year in succession, of Mr. E. V. Evans, O.B.E., F.I.C. In moving the adoption of the annual report for the year ending May 31, 1939, the chairman began by saying that, in the circumstances in which we were to-day, this report could possess no real interest, for we were all engaged in matters of greater importance and urgency. He did not propose, therefore, to comment on the report in any detail, neither did he intend to make any formal speech.

"During the past year," Mr. Evans continued, "the Association has done a large amount of work on behalf of and in conjunction with the Government in preparing and planning for the war which is now with us. This help has been cordially acknowledged. Our task now as an industry is to render the maximum assistance to the country in the prosecution of the war till victory is achieved. We have two further responsibilities. The first to ensure the efficient and adequate production of every chemical that is essential to the life of the nation at this time. Our industry is fortunately in a far stronger position than it was in 1914. But certain adjustments are still necessary to meet the changed conditions. Steps have already been taken to deal with deficiencies in the medicinal field and I am told that provided adequate supplies of the important raw materials can be assured, the Nation and the Empire will not go short of any essential medicament.

"Our second responsibility is to maintain, and, if possible, to develop our export trade. The opportunity now exists to establish ourselves in several countries previously supplied by Germany, and in doing this we help not only ourselves but also the country by providing foreign currency to pay for essential raw materials and foodstuffs. The present export difficulties are appreciated but most of them will, we hope, disappear when the Export Licensing Department is adequately established.

"As the war proceeds we are bound to be faced with new problems; there will be increased requirements for established manufactures and urgent demands for new products. I feel confident that by the exercise of that spirit of wholehearted co-operation which has characterised it in the past, the industry will find ways and means of meeting every call that is made on it, and will more than justify the help which the Government has given to it during the past 20 years.

Government Service

"The Council has placed the services of the Association freely at the disposal of all Government Departments which may want help in chemical matters. Our staff is now busily engaged in dealing with a wide variety of Government problems and in assisting our own members in the many difficulties which the emergency has brought. We all much appreciate the loyal service we have had in the past from our staff, and we feel sure that whatever tasks the future may bring, they will maintain and enhance the prestige of the Association in the eyes of the Government and the Nation. On your behalf I thank them all for their past work and express our best wishes for their future success and security.

"My tenure of office as chairman is at an end. I have had two eventful but very happy years during which I have endeavoured to the best of my ability to uphold the dignity and status of the Association. Such success as I may have had is due to the loyal support I have received from all members at all times. To them, and in particular to my colleagues on the Council, may I express my sincerest thanks for all their willing help. To them I commend my successor, knowing full well that they will give him, in the difficult time that lies ahead, the same generous support as they have always accorded to me."

Points from the Report

The Chemical Section of the British Industries Fair was organised by the Association on the same lines as in previous years. Artistically, the display was an improvement on its predecessors. The section was honoured for the first time for many years by an official visit of inspection by their

Mr. E. V. Evans.

Majesties the King and Queen, who were conducted round the section and expressed great interest in the exhibits which they examined on certain of the stands.

At the request of the Council, the Publicity Committee met the exhibitors in the section to discuss the value of exhibiting at the Fair as a means of publicity, and the possibility of effecting improvements in future years. It was agreed that the section was not properly representative of the industry and that a special effort should be made to enlarge and improve the section, with a view to interesting people of influence in it and impressing them with the importance of the chemical industry to our national economy and security as one of the basic industries of the country.

The problems arising under the Import Duties Act have gradually become fewer, and at present there are only two or three applications for additional duties outstanding. The case of mercuric chloride, previously subject to a Key Industry Duty of 33⅓ per cent. has been brought to a satisfactory conclusion by the imposition of a specific duty of 2s. per lb. The declared value of the imported material was less than the cost to the U.K. makers of the mercury for its production. This is the first case in which a Key Industry Duty has been varied in accordance with the powers granted when these duties were extended in 1936. Last year it was reported that the Association had failed to secure an additional duty on sodium and potassium ferrocyanide. Since then, the position has worsened, especially as regards the potassium compound. The break up of the Continental Convention laid this market open to dumping at completely uneconomic prices. The application for an additional duty was renewed and though the Import Duties Advisory Committee very promptly protected the British production of potassium ferrocyanide by a duty of 2d. per lb., nevertheless large quantities of the foreign material reached these shores before

the new duty became operative. The application for an additional duty in respect of potassium permanganate was allowed to lapse because the advertisement of the case enabled other arrangements to be made to safeguard British production.

Further organic dyestuffs intermediates have been added to the Free List by agreement with the users. The exemption from duty which previously applied to bismuth metal has been extended to alloys containing more than 50 per cent. of bismuth and more than 15 per cent. of lead. The rebate scheme for drums exported with low-priced chemicals has been continued for a further year to December 31, 1939, by agreement with the makers of sheet steel.

Empire Trade Agreements

After many difficulties and delays, a new Trade Agreement was concluded with India early this year. It was found that a considerable number of changes had been made in the list of products for which India had granted British preferences at the Ottawa Conference, and that a number of chemical products had been deleted from this list. No additional preferences were secured.

There have been discussions between this country and Australia and New Zealand regarding the revision of the Ottawa Agreements pertaining to these Dominions, but these have not yet led to any modification of the existing Treaties. In the case of Australia, the Ottawa Agreement is in effect continuing, but the United Kingdom has undertaken not to press its objections to the interpretations now placed by the Australian Tariff Board on Article 10 dealing with reasonable competition, while Australian Ministers have undertaken to make every effort to ensure that the recommendations of the Tariff Board under Article 11 are made effective.

New Zealand has been passing through a difficult time financially and has found it necessary to impose a system of import control of increasing magnitude. The effect on the British chemical industry has been closely examined and certain points taken up; so far the consequences have not been serious, in fact, in some cases the control has diverted purchases to the United Kingdom. Incidentally, this control is at variance with the Ottawa Agreement which still remains in existence in its original form.

After careful examination of the Memorandum of Evidence required by the Eire Prices Commission, it was finally decided not to press any of the cases suggested for a review of the protective duties against the United Kingdom. The Association has also studied the trade agreements between the Dominions and other countries, in particular the Canadian-American Trade Treaty, which was concluded at the same time as the Anglo-American Treaty. As far as chemicals were concerned, the reductions in the margin of British preferences were fewer than had been expected. They will, however, off-set to some extent any potential increase in British chemical exports to the United States arising from the Anglo-American Trade Treaty.

Mention was made in the last autumn report of the representations made by the Association in connection with the negotiations which were then in progress for a new Trade Treaty with the United States. After protracted discussions, a Treaty was concluded towards the end of 1938. The United Kingdom chemical industry secured a number of concessions in the United States market for which the Association had pressed, and was not adversely affected as far as the home market was concerned.

The most important part of the Agreement was the introduction of new principles to deal with wide variations in the rates of exchange and with abnormal competition to United States or United Kingdom producers due to repercussions from third parties because of most favoured nation conditions. Machinery was also provided to deal with dumping by subsidised exports.

The Quarterly Safety Summary and Safety Circulars dealing with items of interest in connection with the technical side of safety in the chemical industry have been continued. Monographs in the series of tests for the detection of toxic gases in industry have been published during the year for aniline vapour, benzene vapour, nitrous fumes and sulphur dioxide. The final wording has been approved for a further five monographs, covering arsine, carbon disulphide, carbon monoxide, chlorine and phosgene. There remains now only the lamp test for organic halogen compounds to complete the series of twelve tests, and the first draft of this has been prepared for discussion.

In connection with the Committee on Industrial Organic Solvents of the Medical Research Council, members have been asked to keep the Association informed of all new solvents introduced for industrial use, and in fact, of any new compound likely to have a wide industrial application. It is intended that these should be scrutinised by the Committee with a view to testing those likely to be of general scientific interest. Because of the limited experimental facilities at present available, however, it has not been found possible to proceed with the testing part of the scheme, or to undertake tests on repayment at the request of individual firms.

The work on the testing of industrial respirator containers, towards which the Association contributed financially, has been completed and a new series of tests with which respirators approved under the Chemical Works Regulations, 1932, must comply, has been drawn up. These tests have been approved by the Works Technical Committee and the contributors to the investigation, but they have not yet been adopted by the Chief Inspector of Factories in replacement of those at present in force. A start has been made with the revision of Part II—Detailed Instructions of the Association's Safety Rules in Chemical Works, but the work has had to be deferred on account of more urgent matters in connection with emergency planning.

Accident Statistics

In accordance with the suggestion made at the annual general meeting last year this brief note is included on the trend of accident statistics in the chemical industry. These statistics are collected by the Association from some 65 firms, the majority of whom are members of the Association. They show that the frequency rate (i.e., the number of lost time accidents per 100,000 man-hours worked) for the last quarter of 1937 was 1.95. This is the highest figure, apart from the corresponding quarter of 1936, since the beginning of 1934. Since then, the frequency rate has dropped consistently to 1.32 until the third quarter of 1938, after which it rose again to 1.70. The severity rate, which measures the actual severity of the accidents, was 1,018 for 1938 as compared with 1,065 for 1937. Most accidents continue to be due to other than purely chemical causes. e.g., 25 per cent. of the 1,782 accidents notified were due to handling goods or articles without machinery and 17 per cent. to tripping and stumbling over obstacles. 11.6 per cent. were due to flying materials from explosions, machinery, etc., but only 1.3 per cent. to gassing or fumes. Correspondingly, therefore, wounds (26 per cent.), bruises (22 per cent.) and strains and sprains (19 per cent.) account for nearly three-quarters of the injuries received. Burns account for only 9.8 per cent., gassing for 0.8 per cent., and eye injuries for 7.5 per cent., respectively. With the exception of wounds, all these are reductions on last year's figures.

Dr. Carr has resigned the chairmanship of the Patents Committee which he has held for nearly ten years, and has been succeeded by Dr. J. A. Lloyd. The Patents Committee has been reconstituted on the basis of a small nucleus standing committee of individual members experienced in patent matters, with panels of firms interested in special subjects who will be co-opted for discussions on such questions. The object is to deal with general questions involving expert knowledge of patent law and procedure on a broad basis in the best and quickest way, while providing for full discussion of questions affecting individual members.

The Council of the Association asked the Patents Committee to examine the hampering effects on British chemical industry of foreign blocking patents with widely drawn claims, with special reference to a suggestion to form a central search bureau for the industry to scrutinise and oppose such applications. The Committee came to the conclusion that the establishment of such a bureau would be impracticable, partly because of the cost but mainly because of the present trend of industrial thought, which is that each firm should be fully acquainted with, and responsible for dealing with, patents in its own particular field. Less than 1 per cent. of applications are capable of effective opposition. At the same time, the Committee is examining the possibility of an approach to the Patent Office to urge that the application of the provisions which already exist in the Patent Law to deal with patent applications of this kind should be more rigidly enforced.

The Committee has considered in some detail a series of suggestions, submitted to the Trade Marks, Patents and Designs Federation, for amendments to the Patent Law designed to strengthen patents by improving their status and validity and to reduce the cost of litigation by setting up a strong Patents Tribunal which would command the confidence of industry. The matter is to be investigated in co-operation with the Federation.

The Association has continued to give active attention to the problems of air raid precautions for factories, the importance and urgency of which has rapidly increased during the year. From being entirely a voluntary affair, these precautions have now become obligatory under the provisions of the Civil Defence Act. The chemical industry, however, largely anticipated this legislation by its actions. It is now three years since the Association first organised meetings of its members for the discussion of air raid problems.

After the crisis in September, 1938, the Council gave serious consideration to the problems that would be likely to arise in the event of an emergency. The Council decided to put the resources of the Association at the disposal of the Government departments concerned with matters of industrial planning. An approach was made to the Director of Industrial Planning at the War Office and the problem was discussed with him and agreement reached as to the lines along which the Association could supplement the work of his Department in obtaining the necessary data regarding the chemical industry. Action has been taken in the direction agreed and a substantial mass of information has been supplied to the Director of Industrial Planning.

The Association has now been advised that the representations which it made at the Public Inquiry regarding the new powers of the Potato Marketing Board, on behalf of its members and the British Plastics Federation, Ltd., have been completely successful. The clauses which would have given the Board power to make from potatoes "alcohols and synthetic organic chemicals from ethyl alcohol; plastics and synthetic resins for use in the moulding, varnish and paint industries" have been deleted.

Tar and Fine Chemical Industries

The Tar Products Group of the Association has worked in the closest co-operation with the Association of Tar Distillers in watching the interests of the tar distillation industry. The tar industry has played a primary part in the study and application of air-raid precautions and in the collection and supply of data required for national planning to meet any emergency.

The Fine Chemical Group and its Medicinal Chemicals Sub-Group have had to deal with numerous problems affecting their section of the industry. The Group is now busy with the final editing of a memorandum which has been under preparation for some time, covering the British equivalents and alternatives and their makers, for the foreign medicinal products at present used in this country.

In short, the Association has continued its usual policy of endeavouring in every possible way to safeguard and promote the interests of the British chemical industry.

Council for the Coming Year

The constitution of the Council for the ensuing year will be as follows:—

President: Mr. E. Wallace. Vice-presidents: Dr. E. F. Armstrong, F.R.S., Dr. F. H. Carr, C.B.E., F.I.C., Sir Christopher Clayton, C.B.E., Ph.D., F.I.C., Mr. E. V. Evans, O.B.E., F.I.C., Mr. C. A. Hill, B.Sc., F.I.C., Sir David Milne-Watson, Bt., D.L., LL.D., Mr. R. G. Perry, C.B.E. Honorary vice-presidents: Sir Martin O. Forster, F.R.S., Mr. Norman N. Holden, Lord McGowan.

Council.—Chairman: Mr. R. Duncalfe; vice-chairman, Mr. C. F. Merriam; honorary treasurer, Dr. P. C. C. Isherwood, O.B.E., F.I.C.; elected members: Mr. F. W. Bain, M.C., Mr. H Ballantyne, F.I.C., Mr. G. E. Howard, Major T. Knowles, Mr. W. F. Lutyens, Mr. L. P. O'Brien, Mr. Donald J. W. Orr, Mr. A. E. Peak, Mr. F. M. Roberts, Mr. Kenneth H. Wilson, Mr. W. J. U. Woolcock, C.M.G., C.B.E.; co-opted members: Mr. C. E. Carey, Dr. A. E. Everest, F.I.C., Lord Trent. There are two vacancies for elected members and one for a co-opted member.

Mr. R. Duncalfe.

CARBON BLACK SALES IN THE U.S.A.

Domestic sales of carbon black in the U.S.A. declined 20 per cent. in 1938 as compared with 1937, according to a report recently issued by the U.S. Bureau of Mines of the Department of Interior. Exports declined 9 per cent. in the same comparison. Although production was curtailed at most carbon black plants, stocks are reported to have increased substantially. Total carbon black produced in 1938 by 24 producers operating 55 plants amounted to 477,039,000 lbs., as compared with 510,606,000 lb. in the previous year.

There were 324,950,000,000 cu. ft. of natural gas burned at carbon black plants in 1938, compared with 341,085,000,000 in 1937. The average yield of carbon black per thousand cu. ft. of gas burned was 1.47 lb. last year as compared with 1.50 lb. in the preceding year. The decline in average yield was attributed to the decline in activity of processes other than the channel of process, since some of these other processes are said to be capable of yielding greater quantities of carbon black. Of the domestic sales of carbon black of 243,474,000 lb., the rubber industry took 217,231,000 lb., or 89 per cent., the ink industry took 14,131,000 lb., or 6 per cent., the paint industry 4,229,000 lb., or 2 per cent., and all other industries absorbed 7,883,000 lb., or 3 per cent.

LETTERS TO THE EDITOR

Spectrochemical Analysis

SIR,—Owing to the war the publication of papers in the English language in *Spectrochimica Acta* is no longer practicable, and it would seem desirable that there should be an agreed single medium for the publication of such papers in England.

There is a natural tendency to send spectrochemical papers on metallurgical subjects to the Iron and Steel Institute and to the Institute of Metals, although papers on the same subject have also been sent to the Society of Chemical Industry; but the spectrochemical technique is applicable not only to the analysis of metals and alloys but to that of soils, vegetable and animal fibres and other substances of interest in botany, biology, pathology and, indeed, most of the sciences.

In my experience of the last few years in dealing with abstracts on this subject, I have repeatedly found papers which have been hidden from the view of many who would be interested in them, because these papers were published in, for example, a pathological journal.

I am writing to ask whether you would agree that it would be well if all papers on spectrochemical analysis should be submitted to the Society of Chemical Industry, it being recognised that the author should at the same time send an ample abstract to the Society or journal dealing with the subject in which he is particularly interested; or developing this idea a little he might, in a paper to the Society of Chemical Industry, describe his methods and in one to his own specialist society, describe the purpose for which the method was employed.

I have consulted the editor of *Chemical and Physiological Abstracts*, and he approves this suggestion.

I am submitting this proposal to a great number of people in this country interested in the subject, and on the receipt of comments on the proposals will proffer a concrete suggestion.—Yours faithfully,

F. TWYMAN,
formerly English Editor of *Spectrochimica Acta*.

London, N.W.1. Oct. 16.

Welding Methods

SIR,—I was very interested to read in your issue on October 14th "The Writer's" reply to my criticisms of his article printed immediately after impartial and factual contribution by Mr. Ferguson of G. A. Harvey and Company, Ltd. I note that "The Writer" does not wish to enter into controversy.

In regard to X-ray examination, Mr. Ferguson's letter admirably expresses the purpose of this test. In a butt weld in steel plate the efficiency of the joint is inherent in the soundness of the weld. It cannot be checked visually by measurement of the reinforcement, overlap or pitch and diameter as of rivets.

For highly stressed work where an efficiency of 90 per cent. is allowed, and where visual examination can tell little, it is not only in the interest of the insurance companies and the users, but also of the welding firms to make use of the X-ray test, which will ensure that there is no possibility of defects being overlooked. This does not imply that defects are expected.

X-ray tests are used in preference to destructive tests which would otherwise be necessary.—Yours faithfully,

The British Oxygen Company, Ltd.,
C. COULSON SMITH,
Chief of Chemical and Metallurgical Section.

London, N.W.2, Oct. 24.

Emergency Addresses

THE DENVER EQUIPMENT CO., LTD., and MESSRS. KNAPP AND BATES, consulting metallurgical and mechanical engineers, have moved their offices from Salisbury House, London, E.C.2, to 493a Northolt Road, South Harrow, Middlesex. (Telephone: Byron 1460 and 2104).

After a short period for reorganisation the LAC RESEARCH LABORATORY, has re-opened in the Chemical Engineering Department of University College, Gower Street, London, W.C.1. The work of the Special Officer Lac Inquiry continues at the permanent address of the Bureau at India House, Aldwych, London, W.C.2.

THE BRITISH COLOUR COUNCIL announces that it will continue at its present address, 28 Sackville Street, London, W.1, until such time as circumstances may make it necessary to remove to a safety zone. It is impossible at the moment to know how far the war may affect supplies of materials and dyestuffs, but the Council, working in collaboration with dyers and dyestuff manufacturers, will continue to recommend colours, not only from the fashion point of view, but those which are economically possible with the dyestuffs and materials available.

NATIONAL FEDERATION OF ASSOCIATED PAINT, COLOUR AND VARNISH MANUFACTURERS, Research Association of British Paint, Colour and Varnish Manufacturers, London Colour, Paint and Varnish Manufacturers Association, Paint Materials Trade Association, Paint Marketing Council, Association of Cellulose Lacquer Manufacturers, British Colour Makers' Association, National Joint Industrial Council for Paint, Colour and Varnish Industry, London District Joint Industrial Council, Tung Oil Estates, Ltd., White Lead/Zinc Oxide Mixtures Agreement, and National Association of Putty Manufacturers are all at Chew Court, Chew Magna, Bristol (telephone: Chew Magna 16).

IMPERIAL CHEMICAL INDUSTRIES, LTD., announce the following amended list of addresses and telephone numbers of their divisional sales offices:—Western Division, Chance and Hunt Social Club, Dog Kennel Lane, Birmingham (telephone: Broadwell 1531); South-Eastern Division, Belmont, The Ridgeway, Mill Hill, N.W.7 (telephone: Mill Hill 3600); North-Western Division, The Ridge, Alderley Edge, Manchester (telephone: Alderley Edge 2231); South-Western Division, Eagle House, Colston Avenue, Bristol, 1 (telephone: Bristol 20051/5); Northern Division, 5 St. Leonard's Place, York (telephone: York 2155); Scottish Division, 4 Blythswood Square, Glasgow, C.2 (telephone: Douglas 7020); Northern Ireland, Imperial House, Donegall Square East, Belfast (telephone 24433/7); Eire, 12 Dawson Street, Dublin, C.8 (telephone 76576/8). The Chemical Export Sales Department has been transferred from the evacuation address at Mill Hill to Cunard Buildings, Liverpool, 3 (telephone: Bank 9280; telegrams: Unique, Liverpool). The Purchasing Department is at I.C.I. (Alkali), Ltd., Winnington Park Recreation Club, Winnington, Nantwich, Cheshire (telephone: Nantwich 1).

THE AMERICAN SECTION of the Society of Chemical Industry has planned the following meetings for 1939-40:—Nov. 10, 1939, Chemical Industry Medal award to Dr. Robert E. Wilson, president of Pan American Petroleum & Transport Co. Joint meeting with American Chemical Society, New York Section; Dec. 8, Joint meeting with American Chemical Society, New York Section; Jan. 12, 1949, Perkin Medal award (election now in progress). Joint meeting with American Chemical Society, American Institute of Chemical Engineers, The Electrochemical Society and Societe de Chimie Industrielle; March 8, Joint meeting with American Chemical Society. Presentation of Nicols Medal by American Chemical Society; April 5, Subject—Foods. Speakers to be announced.

Setting of Cements

A RADIOGRAPHIC study of the phenomena involved in the setting of cements has been made by Couillard (*Comptes Rend.*, 1939, *209*, 8,397-339).

Test pieces of a Portland, a chalk, a slag and an aluminous cement were aged at 18° C. for periods of several hours up to 45 days, and afterwards subjected to temperatures of 0.5°, 45° and 70° C. for periods of some hours up to 90 days. The strength of the test piece was determined, and from the residue, after removal of sand by sieving, an X-ray powder diagram was obtained. In the non-aluminous cements, hardening was accompanied by the development of crystals of an entirely different type from that of the clinker, so that the process of setting with these cements involves a change in mineralogical structure of the material. The rate of this change is increased by increase in temperature, but the change is complete at the end of 3-7 days, after which no further alteration occurs.

In the case of the aluminous cement, at ordinary temperatures (18 and 0.5°) no, or only a very slight, change in crystal structure occurs, even after 28 days; the X-ray spectrum remains substantially the same as that of clinker. At 70°, however, a complete change occurs in three hours, accompanied by a great decrease of strength, which latter phenomenon is well known, and has been attributed by Lafuma to the formation of the compound $Al_2O_3.3CaO.6H_2O$.

Petroleum Products Control

THE Secretary for Mines has made an Order entitled "The Petroleum (No. 2) Order, 1939," which requires that any person other than the Petroleum Board who sells wholesale in this country petroleum and petroleum products, including shale oil products and benzole, should obtain a licence from the Secretary for Mines. The Order came into force on October 16.

All persons and companies affected by the Order should, therefore, apply to the Petroleum Department, Dean Stanley Street, Millbank, London, S.W.1, for a licence. The application should be in writing giving particulars of the petroleum products or benzole ordinarily dealt in by the person or company.

The list of petroleum products covered by the Order is as follows:—

Asphalt, bitumen, petroleum coke, crude and process oils, diesel oil, fuel oil, gas oil, greases, kerosene (including mineral vaporising oil), lubricating oils, motor spirit (including aviation spirit), petroleum jelly, pitch, wax, white spirit and other liquid products (including transformer oils and white oils), and includes also shale oil and the products of shale oil corresponding to the above descriptions of petroleum products.

Benzole is defined in the order to include the following:—

Motor benzole, pure benzole, 90's benzole, industrial benzole, xylodes, coal tar naphtha.

LONDON LECTURE COURSES

With a view to giving assistance to London students who have been unable to follow their University colleges into the provinces, the managers of the Royal Institution have arranged the following special courses of lectures. Students desiring to attend should apply for tickets, for which there will be no charge, to the General Secretary, The Royal Institution, 21 Albemarle Street, London, W.1.

Wednesdays, November 1, 8, 15, 22 at 2.30 p.m.: Four lectures on *Thermodynamics and the Structure of Matter*, by A. R. Ubbelohde, M.A., B.Sc., M.R.I.—Wednesdays, November 29, December 6, 13 at 2.30 p.m.: Three lectures on *Magnetism and the Structure of Matter*, by Kathleen Lonsdale, D.Sc.—Fridays. November 3, 10, 17, 24, December 1, 8, 15 at 2.30 p.m.: Seven lectures on *Infra-Red Spectra and the Structure of Molecules*, by W. H. J. Childs, D.Sc., Ph.D., M.R.I., and H. A. Jahn, M.Sc., Ph.D.

Chemical Research Council

Advisory Body Formed by Chemical Society

THE Council of the Chemical Society have formed an Advisory Research Council, the main function of which will be, when approached, to bring to the notice of Fellows and others engaged in chemical research subjects for investigation likely to be of potential value to the nation at the present time. In the first instance such advice will be made available to unremunerated research workers (that is, unremunerated as research workers for some specific purpose) in universities, colleges and other research institutions, and to research students in receipt of grants not definitely related to any particular topic or in regard to which the topic can be changed. It is hoped to effect liaison with government departments and industrial organisations so that the Advisory Research Council may be cognisant of pressing problems needing investigation and thus be able to suggest lines of research of national value. The work of this Council will be strictly confidential and no acknowledgment will be made of any research undertaken at its suggestion. It will not be a function of this Council to exercise control over any research that may be undertaken.

The field to be covered will embrace every branch of pure chemistry including biochemistry and metallurgy. Chemists and various organisations (industrial and otherwise) will be invited to send in suggestions for research, and a list of topics

Sir Robert Robinson.

for research considered of national importance will be drawn up and will normally be available to those wishing to make use of it for the purpose of initiating an investigation. The Council, however, may be the repository of confidential information; this may often suggest desirable broad lines of research without the necessity of disclosure of the precedents.

The following Fellows of the Society have been appointed members of the Advisory Research Council: Sir Robert Robinson, D.Sc., F.R.S. (chairman); Dr. E. F. Armstrong, F.R.S.; Professor C. H. Desch, D.Sc., F.R.S.; Professor F. G. Donnan, C.B.E, D.Sc., F.R.S.; Professor A. C. G. Egerton, M.A., Sec. R.S.; Dr. J. J. Fox, C.B., O.B.E.; Professor C. R. Harington, M.A., Ph.D., F.R.S.; Professor W. N. Haworth, D.Sc., F.R.S.; Professor I. M. Heilbron, D.S.O., D.Sc., F.R.S.; Professor C. N. Hinshelwood, M.A., Sc.D., F.R.S.; Professor C. K. Ingold, D.Sc., F.R.S.; Dr. L. H. Lampitt, F.I.C.; Dr. W. H. Mills, M.A., F.R.S.; Professor J. C. Philip, O.B.E., D.Sc., F.R.S.; Mr. J. Davidson Pratt, O.B.E., M.A., B.Sc.; Professor E. K. Rideal, M.B.E., D.Sc., F.R.S.; Dr. E. H. Rodd, F.I.C.; Professor N. V. Sidgwick, C.B.E., D.Sc., F.R.S.; Dr. R. E. Slade, M.C., F.I.C.; Dr. G. S. Whitby, LL.D., D.Sc.; with Mr. S. E. Carr as secretary.

A Chemist's Bookshelf

A TEXT-BOOK OF QUANTITATIVE INORGANIC ANALYSIS. By Arthur I. Vogel. Pp. xix and 856. London: Longmans, Green and Co. 18s.

Here is a companion volume to the author's work on Qualitative Analysis, published two years ago, and one which deserves equal success. Dr. Vogel's experience in the field of teaching fully qualifies him to construct a text-book fitted for students of all grades, from the Intermediate B.Sc. class to those preparing for an honours degree in science at the Universities or for the Associateship of the Institute of Chemistry. The theoretical basis of the subject is fully and competently dealt with, as well as its practical applications; and a full and detailed table of contents in systematic order, a good measure of illustrations, and a copious series of appendices, including references to authorities, makes the book valuable to the working analytical chemist as well as to the student.

INDUSTRIAL SOLVENTS, by Ibert Mellan. New York: Reinhold Publishing Corporation. (London: Chapman & Hall, Ltd.). Pp. xi and 480. 66s.

The solvent industry is one that has grown with immense rapidity in the last quarter of a century, and the literature of the subject has, perhaps not surprisingly, been hard put to it to keep pace with the speed of this development. The data were, of course, available, but correlation was in some cases lacking. In this book the material has been gathered together in comprehensive form and a copious supply of graphs and tables enables the reader to obtain with ease a wealth of comparative information. The author is well aware that he is dealing with an industry in full development, and he treats of many solvents that up to the present have not been used on an extensive scale. He wisely remarks in his foreword, "it is entirely possible that some unknown solvent may one day bring about far-reaching changes in the industries." The chapters on the volatility, inflammability and toxicity of commercial solvents, and on the use of solvents in the industries will be found of particular value to the industrial chemist.

INTERMEDIATE CHEMISTRY, by Frederick Prescott. London: University Tutorial Press. Pp. 828. 12s. 6d.

This companion volume to the author's text-book of Organic Chemistry, published last year, covers the requirements of the Intermediate Science student, and is likewise suitable for first-year medical students and those preparing for the chemist and druggist qualifying examination. The introduction of modern concepts, like the electronic theory of valency, the theory of complete ionisation, etc., bring the book up to date; but these, and a certain number of paragraphs in smaller type (as in the companion volume), may be omitted by the student at a first reading. In the second half of the book the elements are dealt with conveniently in accordance with the Periodic Table; but cross-references have been inserted so that the student may read the book in any order. Each chapter terminates with a number of relevant examination questions, reprinted by permission of the University of London.

INORGANIC CHEMISTRY, by P. C. L. Thorne and A. M. Ward. London: Gurney and Jackson. Pp. xii and 911. 28s.

This volume is the third English edition of Professor Fritz Ephraim's *Text-Book of Inorganic Chemistry*, and the first to be produced since Ephraim's death in 1935. The same unstinted praise that was lavished on the earlier editions may safely be conferred on the present volume, and the authors have established their claim "to include a great deal of information as concisely as possible and yet to present it in a palatable form." In the new edition radioactive elements and isotopes have been transferred to their appropriate position in the text and a separate chapter has been devoted to them; the tables of atomic weights and numbers have been revised; and a table of diagrammatic crystal structures is an addition of great value.

Personal Notes

MR. C. G. ABREY, director and manager of the London branch of T. and H. Smith, Ltd., chemical manufacturers, has retired.

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THE title of Reader in Chemistry in the University of London has been conferred on DR. FRED BARROW, M.Sc. (Birmingham, Ph.D. (Strasbourg), in respect of the post held by him at Birkbeck College.

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FOUR BOLTON chemists have been appointed gas identification officers. They are MR. D. BURTON (chief chemist, Wm. Walker and Sons, Ltd.), MR. E. NEEDHAM (chemist, Hacken Sewage Works), MR. S. SHANKS (chief assistant to the public analyst), and MR. D. BURNETT (science master, Bolton school).

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MR. J. WATSON NAPIER, B.Sc., M.I.Chem.E., recently resigned his position as chemical engineer with Newton Chambers and Co., Ltd., to take up an appointment as works manager to Nitrogen Fertilisers, Ltd., Flixborough, near Scunthorpe, at their new synthetic ammonia and fertiliser works.

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SIR FRANK E. SMITH, K.C.B., G.B.E., A.R.C.Sc., D.Sc., LL.D., F.R.S., has been appointed to the Ministry of Supply as Director of Instrument Production. MR. ARTHUR A. ROWSE, M.B.E., M.I.C.E., M.I.M.E., M.I.A.E., M.I.E.E., has been appointed Director of Machine Tools, MR. JOHN ROGERS, O.B.E., F.I.C., Director of Explosives, DR. JAMES WILSON ARMIT, M.A., B.Sc., Deputy Director of Explosives, SIR KEITH PRICE, Director of Chemical Defence Warfare, and MR. CHARLES STANLEY ROBINSON, M.A., F.I.C., M.I.Chem.E., Deputy Director of Chemical Defence Warfare.

OBITUARY

MR. GEORGE DUNCAN MACGREGOR, of George D. MacGregor and Co., oil merchants, Glasgow, died on October 19.

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MR. ALBERT ROBERT MORSON, senior director of Thomas Morson and Son, Ltd., manufacturing chemists, London, died recently at the age of 83. Mr. Morson was educated at University College School, London, and studied at the Royal School of Mines.

TWENTY YEARS AGO

AS long ago as 1919 the search for oil in Scotland was a subject which excited considerable attention. In view of the developments taking place in the industry to-day, it is interesting to note that in its issue of October 25, 1919, THE CHEMICAL AGE commented that a paper read before a meeting of the Mining Institute of Scotland by Mr. H. M. Cadell held out "but little hope of any augmentation of our fuel supplies from this source." The comment continued:—

"These (Mr. Cadell's conclusions) are frankly against any prospect of finding liquid oil in the shale-fields or carboniferous districts of the Lothians or Fife, and as to other districts, he regards the evidence for oil as no better. In the course of the discussion (on the paper) some criticism was offered of the Government's experimental borings for oil in Scotland, as these appear to have been against the weight of geological opinion. As Mr. Cadell himself put it, it was a great mistake on the part of the Government to lay down new bores before they had ascertained the definite results from any single bore that had yet pierced the ground. The results of the present experimental bores are expected to be available shortly, and if they show no substantial yield the question, in view of the strong opinion of Scottish geologists, will probably be regarded as settled."

General News——From Week to Week

IMPERIAL CHEMICAL INDUSTRIES, LTD., announce the addition of Naphthalene Leather Red AS to their range of acid dyestuffs for leather. This new dye is reported to give extremely level results and to build up to exceptionally full shades. It is claimed that where good penetration is desirable along with fullness of shade on the surface, excellent results are produced by combinations of Naphthalene Leather Red AS with Naphthalene Red EAS.

AT A CONFERENCE at the Ministry of Labour last week between the general council of the Trades Union Congress and representatives of the employers it was agreed in principle to set up a joint advisory council. Representatives of the T.U.C and of the Confederation of Employers have been elected to the committee, the setting up of which is recognised as an important step towards full co-operation between the Government, employers and trade unions.

MR. R. F. TAYLOR, chief consulting chemist of Pilkington Bros., St. Helens, in an address to the St. Helens Rotary Club, spoke of the developments in recent years in the glass industry. After describing the processes involved in glass production, he said it was still possible to obtain glass neck ties in St. Helens. This industry stood a good chance of developing into one of national importance, for glass thread, packing and cloth was now being produced. This material was excellent as a waterproof insulation on electric cables, while glass thread of suitable quality made the finest fishing lines obtainable.

THE FIRST MEETING of session 1939-40 of the Bristol section of the Society of Chemical Industry will be held on Thursday, November 2, in the University Chemical Department (Woodland Road), Bristol. At 6.30 p.m. coffee will be served and an opportunity for informal conversation provided. At 7 p.m. Mr. A. T. Green, F.I.C. (Director of Research, British Refractories Research Association), will give a paper on "Modern Trends in Refractory Materials." This meeting will be held jointly with the Chemical Society, the Institute of Chemistry and the Institute of Fuel. All chemists who may be temporarily in the district are cordially invited.

UNDER "NOTES AND COMMENTS" in THE CHEMICAL AGE for July 29 is a statement that the Commonwealth Standing Committee on Liquid Fuels "reports, according to the *Industrial Australian and Mining Standard*, that no technical advance in the production of oil from coal has been made since Sir David Rivett and the Hydrogenation Committee reported, respectively, in 1936 and 1937." Sir David Rivett points out that the Committee's actual remark was "Indications are that there has been substantially no *economic* improvement since . . . 1937." We hasten to correct an error repeated from a usually reliable source of information.

AT PRESENT important extensions are being made to increase the output of the Scottish oil industry. During the past three months great developments have taken place at some centres. At West Calder the new shale mine at Harwood is being rapidly developed, and shale is now being brought to the surface. A new shale pit is also being sunk at West Mains. Between them, these two new sources will provide a vast quantity of shale daily. Of equal importance is the rapid progress being made with the erection of the new oil works in the neighbourhood, which is being linked up to the shale pits. In Broxburn and Winchburgh districts the policy of expansion is also being carried out vigorously, and here also the shale tonnage is being greatly increased.

A MEETING of the Research Fund Committee of the Chemical Society will be held in November next. Applications for grants, to be made on forms obtainable from the General Secretary, must be received on or before Wednesday, November 1, 1939. Applications from Fellows will receive prior consideration. All persons who have received grants, and whose accounts have not been declared closed by the Council, are reminded that reports must be returned by November 1. Attention is drawn to the fact that the income arising from the donation of the Worshipful Company of Goldsmiths is principally devoted to the encouragement of research in inorganic and metallurgical chemistry, and that the income from the Perkin Memorial Fund is to be applied to investigations relating to problems connected with the coal tar and allied industries.

OPERATIVES in the dyeing and finishing and kindred industries will receive increased wages on the first pay day in November. These increases range from 11d. to 2s. 11d. in the weekly wages of male workers, and from 8d. to 1s. 10d. in those of female workers, according to age. The advances are due to a rise of ten points in the Ministry of Labour cost of living index figure since last July. About 80,000 workers will benefit under the new wages list, which will remain in force for three months.

IN VIEW of the fact that the method for decontamination from blister gas by immersion in boiling water cannot be applied to leather articles, because the leather is severely damaged by this treatment, the British Leather Manufacturers' Research Association, in conjunction with the Chemical Defence Research Department, have been investigating other methods for the decontamination of leather. They have now published, in pamphlet form, their report on *The Decontamination, by Means of Warm Water, of Leather and Leather Articles Contaminated with Blister Gas*. The warm water treatment has proved to be equally effective with chemical methods and more simple to operate, as there is no need for a subsequent treatment to remove the chemical solutions which might damage the leather.

THE AIR MINISTRY announce that, after discussion with the firms engaged in the light alloy industry, a voluntary scheme has been instituted for the control of the allocation of orders for aluminium and magnesium light alloys and their distribution. The object of the scheme is to ensure the prompt fulfilment of the requirements of the Defence Departments and to make the fullest use of production. The machinery of control will operate under the general direction of a management committee. The chairman of the committee will be the Director of Materials Production, Air Ministry, who will have Mr. A. J. G. Smout as deputy chairman. The Controllers will be: Mr. Horace Clark (extrusions, tubing and wire); Mr. W. T. Devereux (forgings and stampings); Mr. F. S. Mitman (sheet and strip); Mr. P. Pritchard (casting)s.

Foreign News

THE ENTIRE SUGAR CROP of the West Indies and British Guiana up to August, 1940, has been purchased by the United Kingdom Sugar Controller.

A LARGE nitrogen factory is to be erected at Uleaborg, Finland, in connection with the construction of a large-scale hydro-electrical power station there. The Finnish Government and the municipality of Uleaborg are both interested in the scheme.

THE UNITED STATES imported ammonium phosphate from five countries during 1938, according to statistics published by the Chemical Division of the American Bureau of Foreign and Domestic Commerce (Department of Commerce). Of the total of 29,028 long tons, 21,276, or approximately 70 per cent., was of Canadian origin.

NEW METHODS for the preparation of some substituted barbituric acids are described by the Finnish chemist, H. Aspelund, in Finska Kemistsamfundets Meddelanden (1939, No. 2, p. 87). They include 5-phenyl barbituric acid, 1,5-diphenyl-3-methyl barbituric acid, 5-benzyl-1,3-methyl-phenyl barbituric acid and 5-ethyl-1,3-methyl-phenyl barbituric acid.

STATISTICS dealing with the export of pigments from Belgium during the first five months of 1939 show little change in shipments of these commodities as compared with the corresponding period in 1938. Improvement was noted in exports of lead white, litharge, blanc fixe, and lithopone, while decreases were evidenced in shipments of zinc white, orange mineral, and ochre, but in no case was the alteration large.

ADVANTAGES are claimed by a French inventor to follow the operation of petroleum cracking processes in the presence of an electric arc. An electric furnace with a rotating arc as used in the manufacture of nitrogen compounds is suggested as a suitable plant in which to carry out the conversion of solid fuel or of heavy oils into light oils. It appears that the electric arc makes it possible to reduce the quantity of catalyst or even in some cases to omit it entirely, while the process can also be operated at a lower pressure. The electric arc can also be utilised to advantage in the hydrogenation of coal and in the synthesis of hydrocarbon fuels from carbon monoxide and hydrogen (French Pat. 839,061).

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

PRESERVATION OF TEXTILES.—A. D. Ainley, F. L. Sharp, and Imperial Chemical Industries, Ltd. 26882.

ADAPTING MOTOR VEHICLES to run on coal gas.—R. M. Alexander. 27061.

FURNACES FOR METALLURGICAL PURPOSES.—Allmänna Svenska Elektriska Aktiebolaget. (Sweden, Oct. 3, '38.) 26875.

PROCESS FOR MINERALISING ORGANIC FILTERS for light structural substances.—P. Anft. (Germany, Jan. 28.) 27021.

PROCESS FOR PREPARING a concentrated rubber latex of improved stability.—A. F. Baillie and Revertex, Ltd. 27032.

CARBON BLACKS.—W. Baird, W. J. S. Naunton, J. R. S. Waring, and Imperial Chemical Industries, Ltd. 26881.

TREATMENT OF FABRICS with esters of natural resins.—R. G. Bartlett, F. J. Siddle and Imperial Chemical Industries, Ltd. 26999.

FILTERING OF PRODUCER-GAS.—D. B. Browne. 27066.

INSECTICIDE COMPOSITIONS.—W. H. Davies and Imperial Chemical Industries, Ltd. 27107.

TREATMENT OF POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26810. (United States, Oct. 3, '38.) 27108.

PROCESS FOR COATING SURFACES.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26811.

POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26814, 26884.

PRODUCTION OF POLYAMIDES.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26816. (United States, Sept. 30, '38.) 27002. (United States, Feb. 9.) 27003.

EXTRUSION OF MOLTEN STRUCTURE FORMING COMPOSITIONS.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26883.

MANUFACTURE OF NITRILES.—E. I. du Pont de Nemours and Co. (United States, Sept. 30, '38.) 26885.

MANUFACTURE OF SYNTHETIC RESINS.—E. I. du Pont de Nemours and Co. (United States, Sept. 30, '38.) 26886.

VAPORISATION OF ADIPIC ACID.—E. I. du Pont de Nemours and Co. (United States, Sept. 30, '38.) 27000.

MANUFACTURE OF POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Sept. 30, '38. 27001, 27005.

MANUFACTURE OF ARTIFICIAL FILAMENTS.—E. I. du Pont de Nemours and Co. (United States, Sept. 30, '38.) 27006. (United States, July 6.)) 27007.

PROCESS FOR THE PRODUCTION of liquid saturated benzine hydrocarbons.—J. G. Fife (N. V. Bataafsche Petroleum Maatschappij). 26796.

PROCESS FOR THE PRODUCTION of aromatic hydrocarbons from unsaturated hydrocarbons.—J. G. Fife (N. V. Bataafsche Petroleum Maatschappij). 26797.

MANUFACTURE OF HEXAKISAZO DYESTUFFS, especially suitable for dyeing leather.—J. R. Geigy A.-G. (Switzerland, Oct. 5, '38.) 27180.

PREPARATION OF HIPPURIC ACID DERIVATIVES.—Glaxo Laboratories, Ltd., F. A. Robinson and J. C. L. Resuggan. 26993.

MANUFACTURE OF PICRYL FLUORIDE.—V. Leonard. 27024.

PROCESS FOR THE TREATMENT of bituminous substances, etc.—N. V. Bataafsche Petroleum Maatschappij. (Holland, Oct. 7, '38.) 27004.

PRODUCTION OF HYDROCARBONS by the catalytic conversion of carbon monoxide.—H. E. Potts (N. V. Internationale Koolwaterstoffen Synthese Maatschappij (International Hydrocarbon Synthesis Co.)). 26945.

THIOCYANO ESTERS.—Röhm and Haas Co. (United States, Nov. 8, '38.) 27025.

ELECTROLYTIC PREPARATION of yellow cuprous oxide.—Röhm and Haas Co. (United States, Dec. 10, '38.) 27026.

PROCESS FOR DISINFECTING SEED with aqueous preparations.—F. L. Sharp and Imperial Chemical Industries, Ltd. 27179.

MANUFACTURE OF CATALYST and a process for the conversion of hydrocarbons by means of said catalyst.—Standard Oil Co. (United States, Dec. 31, '38.) 27219.

COMPOUNDED OIL.—Standard Oil Co. of California. (United States, Oct. 4, '38.) 27128.

CATALYTIC DECOMPOSITION OF AMMONIA.—P. H. Sykes and Imperial Chemical Industries, Ltd. 26818.

RECOVERY OF OLEFIN OXIDES from gaseous mixtures.—U. S. Industrial Alcohol Co. (United States, No. 5, '38.) 27113.

PROCESS FOR SEPARATING HIGH-BOILING ORGANIC CONSTITUENTS from non-volatile constituents of water solutions.—U. S. Industrial Alcohol Co. (United States, Oct. 18, '38.) 27174.

MANUFACTURE OF FORMALDEHYDE.—C. Zanleoni and C. Ciampi. (Italy, Oct. 6, '38.) 26867.

PROCESS FOR THE PRODUCTION OF A MODIFIED CASTOR OIL.—Lewis, Berger, & Sons, Ltd. (Sherwin-Williams Co.). 25973.

MOULDS FOR THE PRODUCTION OF CENTRIFUGED PIPES OF PLASTER, etc.—A. Lussana. (Jan 30). (Italy, Jan. 9.) 25819.

COMPLEX ARSENO-COPPER COMPOUNDS.—P. May (Soc. des Usines Chimiques Rhone-Poulenc). 26160.

MANUFACTURE OF THERAPEUTICALLY USEFUL HETEROCYCLIC COMPOUNDS.—May and Baker, Ltd., and J. N. Ashley. 25812.

PRODUCER GAS PLANT.—J. R. Neil. 26161.

PROCESS OF POLYMERISING RUBBER, and the product resulting therefrom.—Newport Industries, Ltd. (United States, Sept. 28 '38.) 26219.

PREPARATION OF PURE MAGNESIUM HYDROXIDE from sea water.—Ocean Salts (Products), Ltd., and B. A. Adams. 26248.

PREPARATION OF MAGNESIUM-SILICATE, talcum, etc., from sea water.—Ocean Salts (Products), Ltd., and B. A. Adams. 26249.

PREPARATION OF ALKALI BICARBONATE, etc., solutions from sea water.—Ocean Salts (Products), Ltd., and B. A. Adams. 26250.

PREPARATION OF MAGNESIUM SULPHATE.—Ocean Salts (Products), Ltd., and B. A. Adams. 26251.

MANUFACTURE AND USE OF ORGANIC COMPOUNDS.—H. C. Olpin, and E. Stanley. 25810.

MANUFACTURE OF LACTONES of the cyclopentanopolyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. (Switzerland, Aug. 17 and Sept. 15, '38.) 25832-3.

MANUFACTURE OF ADENOSENE.—Soc. of Chemical Industry in Basle. (Switzerland, Sept. 16, '38.) 25834; (Switzerland, Sept. 28, '38.)

MANUFACTURE OF NEW ESTERS.—Soc. of Chemical Industry in Basle. (Switzerland, Sept. 16, '38.) (Switzerland, Sept. 28, '38.) (Switzerland, Aug. 22.) 25836

CATALYSTS.—Standard Oil Co. (United States, Oct. 12, '38.) 25907.

CATALYTIC CRACKING PROCESS.—Standard Oil Development Co. (United States, Dec. 29, '38.) 25905.

MANUFACTURE OF ADHESIVE BITUMENS.—Standard Oil Development Co. (Sept. 15, '38.) (France, Jan. 26, '38.) 26236.

SOLVENT TREATMENT OF LOWER BOILING HYDROCARBONS.—Standard Oil Development Co. (United States, Dec. 7, '38.) 26270.

NEUTRALISING-AGENTS FOR POISON GASES.—V. A. Trier, and Andre (Components), Ltd. 26082, 26083, 26084.

PROCESS FOR THE FRACTIONAL SEPARATION OF HYDROCARBON MIXTURES.—Universal Oil Products Co. (United States, Sept. 16, '38.) 25856.

TREATMENT OF TEXTILE FIBRES.—J. Wharton, B. P. Ridge and Imperial Chemical Industries, Ltd. 25794.

HARDENING OF SYNTHETIC FORMALDEHYDE PRODUCTS.—Yorkshire Dyeware and Chemical Co., Ltd., C. S. Bedford, R. K. Fourness, and J. Bedford. 25807.

METALLURGICAL REDUCTION PROCESSES.—Alloy Processes, Ltd. (Armandias). 26324.

PHOSPHORIC ACID CATALYSTS.—Anglo-Iranian Oil Co., Ltd., and D. G. Smith. 26335.

DYEING CELLULOSIC FIBRES.—H. Blackshaw, N. H. Haddock, and Imperial Chemical Industries, Ltd. 26602.

APPARATUS FOR CLEANING AND PURIFYING USED OIL.—T. W. Bryson. 26310.

CHEMICAL PROCESSES AND PRODUCT.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38) 26598.

PRODUCTION OF LACTAMS by the rearrangement of cyclic ketoximes.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26599.

MOULDING OF POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Sept. 30, '38.) 26680.

MANUFACTURE OF SHAPED ARTICLES from polymeric materials.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26681.

POLYAMIDE COMPOSITIONS.—E. I. du Pont de Nemours and Co. (United States, Sept. 29, '38.) 26682.

MANUFACTURE OF POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co., and W. E. Hanford. 26600.

MANUFACTURE OF AGENTS for improving the fastness of directly dyed cellulose fibres.—J. R. Geigy A.-G. (Switzerland, Sept. 22, '38.) 26326.

MANUFACTURE OF AGENTS for improving the fastness of directly dyed cellulose fibres.—J. R. Geigy, A.-G. (Switzerland, July 6.) (Cognate with 26326.) 26327.

REFINING OF METALS AND PREPARATION OF ALLOYS.—Goodlass Wall and Lead Industries, Ltd., W. T. Butcher, W. W. Robson, and W. E. Green. 26329.

MANUFACTURE OF PIGMENTS.—N. H. Haddock and Imperial Chemical Industries, Ltd. 26603.

MANUFACTURE OF PERCHLORETHYLENE.—W. N. Howell and Imperial Chemical Industries, Ltd. 26601.

MANUFACTURE OF DIAMINOALKANES.—Imperial Chemical Industries, Ltd. (United States, Sept. 24, '38.) 26348.

MANUFACTURE OF AMINONITRILES.—Imperial Chemical Industries, Ltd. (United States, Sept. 24, '38.) 26349.

PROCESS FOR THE PRODUCTION of coloured protective layers on castings, etc., of magnesium base alloys.—Magnesium Elektron, Ltd. (Germany, Feb. 23 and Nov. 8, '38.) 26437-8.

METHOD OF SURFACE TREATING objects of cast magnesium base alloys.—Magnesium Elektron, Ltd. (Germany, Feb. 23.) 26436.

MANUFACTURE OF DERIVATIVES of the cyclopentanopolyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. (Switzerland, Sept. 9 and Sept. 13, '38.) 26616-7.

MATTING PROCESS.—Soc. of Chemical Industry in Basle. (Switzerland, Aug. 18 and Sept. 30.) 26668-9.

MANUFACTURE OF COMPOUNDS of the cyclopentanopolyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. (Switzerland, Sept. 30, '38, Jan. 26, Aug. 21.) 26670-1-2.

PRODUCTION OF SYNTHESIS GAS with the simultaneous recovery of tar oils and valuable hydrocarbons.—Woodall-Duckham (1920), Ltd. (Didier-Werke Akt.-Ges.). 26302.

Complete Specifications Open to Public Inspection

MANUFACTURE OF CYCLOPENTANOPOLYHYDROPHENANTHRENE DERIVATIVES.—Soc. of Chemical Industry in Basle. March 17, 1938. 31852/38.

PREPARATION OF ISOPHORONES.—Röhm and Haas Co. March 17, 1938. 2238/39.

MAGNESIUM HYDROXIDE COMPOSITION of matter, and process of obtaining the same.—C. H. Phillips Chemical Co. March 17, 1938. 3909/39.

PROCESS FOR MAKING OLEFINE OXIDES.—Carbide and Carbon Chemicals Corporation. March 15, 1938. 3935/39.

PROCESS FOR THE PRODUCTION of stable and injectable organic calcium salt solutions.—G. A. R. von Wulfing and E. M. H. Rosskothen (trading as J. A. Wulfing (firm of)). March 12, 1938. 5001/39.

METHOD FOR IMPREGNATING paper, cloth, or similar materials with chemicals.—A. Farkas. March 12, 1938. 5290/39.

PROCESS FOR THE PRODUCTION OF ESTERS of 2-keto-levo-gulanic acid.—A. Corbellini. March 15, 1938. 7376/39.

FORMATION OF CO-PRECIPITATED and coalesceable calcium sulphate and iron hydroxide.—H. S. Colton. March 17, 1938. 7644/39.

METHODS AND APPARATUS for extrusion of thermo-plastic materials.—G. W. Wacker. March 12, 1938. 7844/39.

PROCESS AND APPARATUS for effecting metallurgical reactions.—Soc. d'Electro-Chimie, d'Electro metallurgie, et des Acieres Electriques d'Ugine.—March 15, 1938. 7872/39.

DYEING OF MIXED FIBRES.—I. G. Farbenindustrie. March 14, 1938. 8034/39.

TREATMENT OF MATERIALS made of or containing an organic derivative of cellulose.—Kodak, Ltd. March 14, 1938. 8113/39.

PREPARATION OF VITAMIN COMPOSITIONS.—Distillation Products, Inc. March 15, 1938. 8244/39.

PROCESSES FOR OBTAINING CELLULOSE for rayon from resinous pine woods.—F. C. Palazzo. March 16, 1938. 8287/39.

PROCESS FOR SACCHARIFYING CELLULOSE for obtaining from wood substances sugar solutions adapted to produce industrial alcohol. M. Gierdani and P. Leone. March 16, 1938. 8356/39.

MANUFACTURE OF SUGAR DERIVATIVES of non-steroids having the effect of steroid hormones.—Soc. of Chemical Industry in Basle. March 16, 1938. 8415/39.

METHOD OF PRODUCING NEUTRONS.—Licentia Patent-Varvaltungs-Ges. March 16, 1938. 8487/39.

ARRANGEMENT FOR EFFECTING REACTIONS between gases and vapours and pulverous substances.—Comptoir des Textiles Artificiels. March 18, 1938. 8490/39.

MANUFACTURE OF ADHESIVES for the fabrication of luminated paper products.—Philadelphia Quartz Co. March 16, 1938. 8497/39.

HYDROGENATION OF ADIPONITULE.—E. I. du Pont de Nemours and Co. March 17, 1938. 8616/39.

MANUFACTURE OF CONDENSATION PRODUCTS from tirmethylhydroquinone. March 18, 1938. 8708/39.

PRODUCTION OF ALUMINIUM FLUORIDE.—Rutgerswerke-Akt.-Ges., and L. Kahl. March 9, 1938. 5620/39.

FURNACE PLANT FOR MELTING AND REFINING METALS and metallurgical products.—Metallges. Akt.-Ges. March 9, 1938. 5679/39.

MANUFACTURE OF β-CHLOROPROPIONIC ACID.—Rohm & Haas Ges. March 9, 1938. 7552/39.

ALLOYS HAVING AN IRON-NICKEL BASIS.—Fides Ges. fur die Verwaltung und Verwertung von Gewerblichen Schutzrechten. March 8, 1938. 7557/39.

PLASTIC MATERIAL, AND METHOD OF MAKING SAME.—G. H. Vulliet-Durand. March 10, 1938. 7664/39.

MANUFACTURE OF POLYAZO-DYESTUFFS.—I. G. Farbenindustrie. March 11, 1938. 7870/39.

RUBBER COMPOUNDS, AND METHOD OF MAKING THEM.—J. Stein. Jan. 21, 1937. 26175/39.

PROCESS FOR PREPARING ISOPHORONE.—Carbide and Carbon Chemicals Corporation. March 19, 1938. 4908/39.

PREPARATION OF DI-OLEFINES.—Usines de Melle. March 21, 1938. 4971/39.

INTRODUCTION OF CHROMIUM into iron and steel articles by diffusion.—K. Daeves, G. Becker and F. Steinberg. March 23, 1938. 5814/39.

HYDROLYSIS OF CELLULOSIC MATERIALS.—Chemische Fabrik Lowenberg Dr. Warth and Co. March 21, 1938. 7715/39.

PROCESS FOR THE PURIFICATION OF WATER, particularly for the removal of the silica therein contained.—Auxiliare des Chemins de Fer et de L'Industrie and G. V. Austerweil. March 15, 1938. 7771/39.

PROCESS FOR THE MANUFACTURE of valuable products, especially ketenes and olefines.—N. V. de Bataafsche Petroleum Maatschappij. March 19, 1938. 7839/39.

PROCESS FOR THE PRODUCTION OF DRY ALBUMEN.—Metallges, A.-G. March 12, 1938. 8082/39.

ARTIFICIAL DIGESTION OF ALBUMINOID and fatty substances.—F. Percheron. March 22, 1938. 8489/39.

PROCESS FOR THE EXTRACTION and dewaxing of mineral oils.—Edeleanu Ges. March 22, 1938. 8537/39.

PURIFICATION OF NITRILES.—E. I. du Pont de Nemours and Co. March 23, 1938. 8617/39.

PROCESS FOR THE PRODUCTION of oxidic protective layers on magnesium or magnesium alloys.—Langbein Pfanhauser-Werke A.-G. March 22, 1938. 8753/39.

PROCESS FOR FINISHING TEXTILE MATERIALS.—I. G. Farbenindustrie. March 22, 1938. 8802/39.

MANUFACTURE OF A HOMOGENEOUS PLASTIC MATERIAL by impregnation.—G. H. Vulliet-Durand. March 19, 1938. 8835/39.

PRODUCTION OF FIRE-EXTINGUISHING FOAM.—H. F. Hansen-Ellehammer. March 21, 1938. 8934/39.

TREATMENT OF DYEINGS prepared on cellulose materials by means of substantive dyestuffs.—I. G. Farbenindustrie. March 24, 1938. 9216/39.

MANUFACTURE AND APPLICATION of acid leuco-sulphuric acid esters and their salts of anthraquinone-naphthalene carbazoles.—I. G. Farbenindustrie. March 24, 1938. 9346/39.

Specifications Accepted with Date of Application

HEAT-TREATMENT OF CARBONACEOUS MATERIALS.—A. McCulloch, Jan. 18, 1938. 512,882.

MANUFACTURE OF AZO DYESTUFFS.—Soc. of Chemical Industry in Basle. March 8, 1937. 512,939.

METHOD OF PREPARING UREA DERIVATIVES suitable for use as vulcanisation accelerators.—Wingfoot Corporation. July 15, 1937. 512,942.

MANUFACTURE OF SOLID DIAZONIUM SALTS.—W. W. Groves (I. G. Farbenindustrie). March 16, 1938. 512,798.

MANUFACTURE OF ACYLACETIC ARYLIDES having substantive properties.—W. W. Groves (I. G. Farbenindustrie). March 16, 1938. 512,799.

MANUFACTURE OF ORGANIC ESTERS.—J. H. Brown, J. S. Watt, and Imperial Chemical Industries, Ltd. March 16, 1938. 512,806.

MANUFACTURE OF AZO DYESTUFFS and derivatives thereof.—E. I. du Pont de Nemours and Co. March 23, 1937. 512,830.

PROCESS FOR THE MANUFACTURE OF CONDENSATION PRODUCTS of the anthraquinone series.—I. G. Farbenindustrie. March 17, 1937. 512,841.

MANUFACTURE OF AZO DYESTUFFS insoluble in water.—W. W. Groves (I. G. Farbenindustrie). March 18, 1938. 512,844

MANUFACTURE OF ACYLACETIC DERIVATIVES having substantive properties.—W. W. Groves (I. G. Farbenindustrie). March 18, 1938. 512,845.

MANUFACTURE OF ETHER-ALCOHOL DERIVATIVES of cyclic amidines. I. G. Farbenindustrie. March 18, 1937. 512,846.

CONCENTRATION AND DECOLORATION of denitrated spent sulphuric acid.—N. Titlestad, L. N. Allen, jun., and Chemical Construction Corporation. March 18, 1938. 512,907.

MANUFACTURE OF POLYVINYL ACETAL RESINS.—Kodak, Ltd. (Eastman Kodak Co.). March 22, 1938. 512,987.

MANUFACTURE OF MONO-AZO DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie). March 23, 1938. 512,864.

MANUFACTURE OF KETONES or secondary alcohols of the cyclopentanopolyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. March 29, 1937. 512,954.

MANUFACTURE OF NITROCELLULOSE PRODUCTS.—F. H. Reichel and A. E. Craver. March 24, 1938. 512,960.

MANUFACTURE OF NITRATES of alkalies, alkaline earths, and ammonia.—H. Pauling. March 27, 1937. 512,872.

MOULDS AND MOULDED ARTICLES, and a method of moulding synthetic resin materials. W. J. Tennant (Aktiebolaget Swedish Artid). March 25, 1938. 512,992.

ELECTROLYTIC PRODUCTION of persulphuric acid and persalts, and apparatus for carrying out the process.—Oesterreichische Chemische Werke Ges. May 21, 1937. 512,966

MANUFACTURE OF K-STROPHANTHINE-β.—Chemical Works, formerly Sandoz. April 21, 1937. 512,998.

REGENERATING FUSED SALTPETRE BATHS used for the heat-treatment of metals or alloys.—I. G. Farbenindustrie. April 27, 1937 513,002.

TREATMENT OF PETROLEUM DISTILLATES and the separation therefrom of a compound or compounds functioning as inhibitors.—Trinidad Leaseholds, Ltd., E. Hene and A. G. V. Berry. Dec. 29, 1937. 513,105.

MANUFACTURE OF CHROMATES.—M. J. Udy. Nov. 30, 1937. 513,152.

PURIFYING HYDROCARBON COMPOUNDS in the gaseous stage.—Soc. Industrielle des Carburants et Solvants. Feb. 1, 1937. 513,108.

Weekly Prices of British Chemical Products

CONDITIONS in the general chemical market continue to follow a very steady course and the volume of firm orders for spot or near delivery is of substantial dimensions. So far as existing contracts are concerned, the movement to the main consuming industries is reported to be satisfactory, but deliveries against new business is in one or two instances somewhat slow. There are no important changes in quotations to record and steady to firm price conditions prevail with nominal rates being quoted for a number of products for which supplies are dependent on overseas sources. The outstanding feature in the coal tar section is the transfer to the control of the Mines Department of the Board of Trade of a fairly wide range of products and for such items nominal prices are quoted pending the Control's instructions. Stocks of cresylic acid are plentiful and the quotation is a little easier.

MANCHESTER.—Reasonably active trading conditions have again been reported on the Manchester chemical market during the past week. Delivery specifications against contracts from one or two of the consuming industries in Lancashire and the West Yorkshire district are only moderately satisfactory, but in most directions good quantities are being called for. There is also a fair demand for the leading "heavies" for prompt delivery, and the market as a whole is on a firm basis. With regard to the tar products the situation is somewhat uncertain for the time being in consequence of the control of such materials as benzol, naphtha and xylol.

GLASGOW.—Business is steady in the Scottish heavy chemical market, but prices everywhere are on the upgrade.

Price Changes

Falls: Benzidine, HCl.

*In the case of certain products, here marked with an asterisk, the market is nominal, and the last ascertainable prices have been included.

†Coal Tar Products: The position with regard to prices of benzol, naphtha, pitch, toluol and xylol is doubtful, owing to possibilities of control. For the time being we include last week's prices which should obtain. The rise predicted for benzol 90's did not materialise.

General Chemicals

ACETIC ACID.—Maximum prices per ton: 40% technical, 1 ton or over, £15 12s.; 10 cwt. and less than 1 ton, £16 12s.; 4 cwt. and less than 10 cwt., £17 12s.; 80% technical, 1 ton, £29 5s.; 10 cwt./1 ton, £30 5s.; 4/10 cwt., £31 5s.; 80% pure, 1 ton, £31 5s.; 10 cwt./1 ton, £32 5s.; 4/10 cwt., £33 5s.; commercial glacial, 1 ton, £37; 10 cwt./1 ton £38; 4/10 cwt., £29; delivered buyers' premises in returnable barrels.

ACETONE.—Maximum prices per ton, 50 tons and over, £39; 10/50 tons, £39 10s.; 5/10 tons, £40; 1/5 tons, £40 10s.; single drums, £41 10s., delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

*ALUM.—Loose lump, £8 7s. 6d. per ton d/d.

*ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—99.95%, 1s. to 2s. per lb. according to quantity in loaned cylinders, carriage paid; less for important contracts.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising £21 per ton, in casks, ex wharf. See also Salammoniac.

AMMONIUM DICHROMATE.—1s. per lb. d/d U.K.

*ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Prices nominal, f.o.b. Antwerp, subject to works acceptance.

BARIUM CHLORIDE.—Market nominal.

BLEACHING POWDER.—Spot, 35/37% £9 5s. per ton in casks, special terms for contract.

BORAX COMMERCIAL.—Granulated, £18 per ton; crystal, £19; powdered, £19 10s.; extra finely powdered, £20 10s.; B.P. crystals, £27; powdered, £27 10s.; extra fine, £28 10s. per ton, in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £60; powder, £61; in tin-lined cases for home trade only, packages free, carriage paid in Great Britain.

BORIC ACID.—Commercial granulated, £32 per ton; crystal, £33; powdered. £34; extra finely powdered. £36; large flakes, £44 10s.; B.P. crystals, £41; powdered, £42; extra fine powdered, £44 per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain.

CALCIUM BISULPHITE.—£7 5s. per ton f.o.r. London.

*CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

CHARCOAL LUMP.—£7 5s. to £11 per ton, ex wharf. Granulated £7 to £9 per ton according to grade and locality.

*CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

*CHROMETAN.—Crystals, 3d. per lb.; liquor, £13 per ton d/d station in drums.

CHROMIC ACID.—10¾d. per lb., less 2½%: d/d U.K.

*CHROMIC OXIDE.—11¾d. per lb.; d/d U.K.

CITRIC ACID.— 1s 1d. per lb. MANCHESTER: 1s. 1¼d..

*COPPER SULPHATE.—£18 5s. per ton, less 2% in bags. MANCHESTER: £23 per ton f.o.b. GLASGOW: £19 10s. per ton, less 5%, Liverpool in casks.

*CREAM OF TARTAR.—100%, £4 12s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—40% by volume, £25 to £27 per ton, according to quantity, in casks, ex store.

FORMIC ACID.—85%. £42 per ton for ton lots, ex store, in cylinders; smaller parcels quoted at 45s. 6d. to 47s. 6d. per cwt., ex store.

GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

HEXAMINE.—Technical grade for commercial purposes, 1s. 4d. per lb.; free-running crystals are quoted at 1s. 7d. per lb.; carriage paid for bulk lots.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 11s. 2d. per lb. in 7 lb. lots.

*LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £48 to £50, ton lots. MANCHESTER: Market nominal. GLASGOW: Market nominal.

LEAD NITRATE.—About £40 per ton in casks.

LEAD, RED.—English, 5/10 cwt., £35; 10 cwt. to 1 ton, £34 15s.; 1/2 tons, £34 10s.; 2/5 tons, £34; 5/20 tons, £33 10s.; 20/100 tons, £33; over 100 tons, £32 10s. per ton, less 2½ per cent. carriage paid; non-setting red lead, 10s. per ton dearer in each case; Continental material, £1 per ton cheaper.

LEAD, WHITE.—Dry English, less than 5 tons, £45; 5/15 tons, £41; 15/25 tons, £40 10s.; 25/50 tons, £40; 50/200 tons, £39 10s. per ton, less 5% carriage paid; Continental material £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £53; 5/10 cwt., £52; 10 cwt. to 1 ton, £51 10s.; 1/2 tons, £50; 2/5 tons, £49; 5/10 tons, £47; 10/15 tons, £46; 15/25 tons, £45 10s.; 25/50 tons, £45; 50/100 tons, £44 10s. per ton, less 5% carriage paid. Continental material £2 per ton cheaper.

LITHARGE.—10 cwt.-1 ton, £34 15s. per ton.

*LITHOPONE.—Maximum prices, 28/30 per cent., £15 10s. per ton, 60 per cent., £29 per ton, delivered buyers' premises. Owing to decontrol a considerable rise may be expected.

MAGNESITE.—Calcined, in bags, ex works, about £9 to £10 per ton.

MAGNESIUM CHLORIDE.—Solid (ex wharf), £10 per ton.

*MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY PRODUCTS.—Controlled prices for 1 cwt. quantities: Bichloride powder, 6s. 4d.; bichloride (industrial users), 6s. 4d.; bichloride lump, 6s. 11d.; bichloride ammon. powder, 7s. 10d.; bichloride ammon. lump, 7s. 8d.; mercurous chloride, 7s. 8d. mercury oxide, red cryst., B.P., 9s.; red levig. B.P., 8s. 6d.; yellow levig. B.P., 8s. 4d.

*METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.

*NITRIC ACID.—Spot, £25 to £30 per ton, according to strength, quantity and destination.

OXALIC ACID.—£48 5s. per ton for ton lots, ex wharf, in casks, smaller parcels, 53s. to 57s. per cwt., ex store; deliveries slow.

*PARAFFIN WAX.—GLASGOW: 3¾d per lb

POTASH, CAUSTIC.—Market nominal. MANCHESTER: £47 per ton.

POTASSIUM CHLORATE.—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

*POTASSIUM DICHROMATE —5¼d. per lb. carriage paid. GLASGOW: 5½d. per lb., net, carriage paid.

POTASSIUM CHROMATE.—2s. per lb. d/d U.K.

POTASSIUM IODIDE.—B.P., 9s. 10½d. per lb. in 7 lb. lots; for not less than 1 cwt., 7s. 9d. per lb.
POTASSIUM NITRATE.—Small granular crystals, £26 to £29 per ton ex store, according to quantity.
POTASSIUM PERMANGANATE.—Commercial, about 10¾d. per lb., delivered.
POTASSIUM PRUSSIATE.—Yellow, market nominal, supplies scarce.
SALAMMONIAC.—Dog-tooth crystals, £40 per ton; medium, £39; fine white crystals, £20; in casks, ex store.
SALT CAKE.—Unground, spot, £3 15s. per ton.
SODA ASH.—Light 98/100%, £5 17s. 6d. per ton f.o.r. in bags.
SODA, CAUSTIC.—Solid, 76/77° spot, £13 10s. per ton d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE.—£25 to £26 per ton, ex wharf.
SODIUM BICARBONATE.—About £10 10s. per ton, in bags.
SODIUM BISULPHITE POWDER.—60/62%. £12 10s. to £14 per ton d/d in 2-ton lots for home trade.
SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.
SODIUM CHLORATE.—£27 10s. to £32 per ton, d/d according to quantity.
*SODIUM DICHROMATE.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts. GLASGOW: 4¼d. per lb., carriage paid.
*SODIUM CHROMATE.—5d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—Pea crystals, £15 15s. per ton for 2-ton lots; commercial, £11 15s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
*SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 5s. per ton for 6-ton lots d/d.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £16 to £17 per ton delivered for ton lots. Tri-sodium, £18 10s. per ton delivered per ton lots.
SODIUM PRUSSIATE.—4¼d. to 5¼d. per lb.
SODIUM SILICATE.—£8 2s. 6d. per ton.
*SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
*SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £3 15s.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.
*SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.
*SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.—1s. 2d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 2d. per lb.
*ZINC OXIDE.—Maximum prices: White seal, £23 10s. per ton; red seal, £19 10s.; green seal, £22 10s. d/d buyers' premises. Owing to decontrol a considerable rise may be expected.
*ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2-cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 8d. to 1s. 4d. per lb., according to quality. Crimson, 1s. 8½d. to 1s. 9½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 6d. to 1s. 8d. per lb.
CARBON DISULPHIDE.—£38 to £41 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£48 to £53 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 1s. 3d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5d. per lb.; dark 3¾d. to 4¾d. per lb.
SULPHUR CHLORIDE.—6d. to 8d. per lb., according to quantity.
VEGETABLE BLACK.—£35 per ton upwards; 28/30%, £15 10s. 0d.; 60%, £29, delivered buyers' premises.
ZINC SULPHIDE.—£56 per ton ex works.

Plus 5% War Charge.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1940; September, £7 5s.; October, £7 6s. 6d.; November, £7 8s.; December, £7 9s. 6d.; January, 1940; £7 11s., February £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1940; September £8 2s. 6d.; October £8 3s. 9d.; November £8 5s.; December, £8 6s. 3d.; January, 1940, £8 7s. 6d.; February £8 8s. 9d.; March £8 10s.; April/June, £8 11s. 3d.
NITRO-CHALK.—£7 10s. 6d. per ton up to June 30, 1940.
SODIUM NITRATE.—£8 5s. per ton for delivery up to June 30, 1940.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

†BENZOL.—At works, crude, about 1s. 0¾d. per gal.; standard motor, 1s. 6½d. to 1s. 7d.; 90's, 1s. 4½d. to 1s. 5d.; pure, 1s. 8½d. to 1s. 9d. MANCHESTER: Crude, 1s. 0½d. to 1s. 1d. per gal.; pure, 1s. 8½d. per gal.
CARBOLIC ACID.—Crystals, 9d. per lb.; Crude, 60's, 3s. to 3s. 3d. according to specification. MANCHESTER: Crystals, 8¼d. to 9d. per lb., d/d.
CREOSOTE.—Home trade, from 4d. per gal., f.o.r., makers' works; exports 6d. to 6¼d. per gal., according to grade. MANCHESTER: 4d. to 5¼d.
CRESYLIC ACID.—98/100%, 2s. 6d. to 2s. 9d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 2s. 10d.
†NAPHTHA.—Solvent, 90/160°, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160°, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190°, 1s. 1¼d. to 1s. 3d. per gal., naked at works, according to quantity. MANCHESTER: 90/160° 1s. 6d. to 1s. 8d. per gal.
NAPHTHALENE.—Crude, whizzed or hot pressed, £6 to £6 10s. per ton; purified crystals, £9 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £17.
†PITCH.—Medium, soft, 35s. per ton, f.o.b. MANCHESTER: 27s. 6d. f.o.b. East Coast.
PYRIDINE.—90/140%, 17s. 6d. per gal.; 90/160%, 15s.; 90/180%, 3s. to 4s. per gal. f.o.b. MANCHESTER: 14s. to 17s. per gallon.
†TOLUOL.—90%, 2s. 1d. to 2s. 2d. per gal.; pure, 2s. 6d. to 2s. 7d. MANCHESTER: Pure, 2s. 7d. per gallon, naked.
†XYLOL.—Commercial, 2s. 3d. per gal.; pure, 2s. 5d. MANCHESTER: 2s. 6d. per gallon.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 5s. to £8 per ton; grey, £9 to £11. MANCHESTER: Grey, £14.
METHYL ACETONE.—40.50%, £35 to £38 per ton.
WOOD CREOSOTE.—Unrefined, 8d. to 1s. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.—3s. 3d. to 3s. 8d. per gal.; solvent, 3s. 4d. to 3s. 9d. per gal.
WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—1s. 10d. per lb., for cwt. lots, net packages.
BENZIDINE, HCl.—2s. 7d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL 34/35° C.— 1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—2s. 1½d. to 2s 5½d. per lb.
DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.
DIPHENYLAMINE.—Spot, 2s. 3d. per lb.; d/d buyer's works.
GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.
H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.
NAPHTHIONIC ACID.—1s. 10d. per lb.
β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.
α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.
β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.
o-NITRANILINE.—4s. 3½d. per lb.
m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 10d. to 1s. 11d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8¾d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON, Oct. 25.—Prices to October 28 (per ton, net, naked, ex mill or refinery, and subject to additions according to package):—LINSEED OIL.—Raw, £36. RAPE OIL.—Crude, £44 5s.; refined, £46 17s. 6d. COTTONSEED OIL.—Crude, £23; common edible, washed, £25 15s.; refined deodorised, £27 10s. SOYA BEAN OIL.—Crude, £27; refined, £31. GROUNDNUT OIL. Crude, £29 10s.; refined deodorised, £34; refined hardened, £38. COCONUT OIL.—Crude, £22 2s. 6d.; refined, £25 7s. 6d. PALM OIL.—Refined, £27. PALM KERNEL OIL.—Crude, £21 10s.; refined, £24 15s. WHALE OIL.—Hardened, £22 10s. Acid oils (per ton, naked, ex works):—Groundnut, £16; soya bean, £15; coconut and palm kernel, £18 10s. Non-controlled commodities were in fair demand. ROSIN, 27s. 6d. to 31s. per cwt., according to grade. TURPENTINE, 58s. 6d. per cwt., spot American, including tax, ex wharf, barrel, and ex discount.

Commercial Intelligence

The following are taken from printed reports. but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

DELLWOOD, LTD., London, E., chemists.—(M., 28/10/39.) October 17, £500 debenture to R. Wyler, London; general charge.

MARINE PAINTS AND COMPOSITIONS, LTD., London, E.C. (M., 28/10/39.) October 11, charge to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; charged on land at Chessington.

THOMAS CREW AND SONS, LTD., Macclesfield, silk finishers and dyers. (M., 28/10/39.) October 14, mortgage and a charge to Westminster Bank, Ltd., each securing all moneys due or to become due to the bank; charged on garage and other premises etc., at Vincent Street and on mill and premises at Vincent Street and Rodney Street and cottages Nos. 9, 11, 13, and 15 Rodney Street, all Macclesfield, together with a mill or factory near by or adjoining, etc. *£3,400. March 4, 1938.

Companies Winding-Up Voluntarily

PHENSIC LIMITED. (C.W.U.V., 28/10/39.) Meeting of members, 68 Pall Mall, S.W.1, on Wednesday, November 22. B. L. Hobrow, liquidator.

Satisfactions

FRANCOIS CEMENTATION CO., LTD., London, E.C. (M.S., 28/10/39.) Satisfaction October 12, of debenture stock registered December 24, 1930.

KILLAMARSH GAS LIGHT AND COKE CO., LTD. (M.S., 28/10/39.) Satisfaction October 17, of debenture registered April 4, 1930

Company News

Cerebos, Ltd., have declared an interim dividend of 10 per cent. This figure has been maintained for the past four years.

Bronze Powder Manufacturers, Ltd., changed their name to British Bronze Powder Manufacturers, Ltd., on October 12, 1939.

New Companies Registered

South Wales Magnesia, Ltd.—Private company. Capital, £4,999 in 4,999 shares of £1 each. To carry on the business of producers of and dealers in minerals, ores, metals, chemicals and fabrics, etc. Subscribers (each with one share): Walter J. Parry, 9 Southampton Place, W.C.1; Joyce Johnston. The first directors are to be appointed by the subscribers. Solicitor: W. J. Parry, 9 Southampton Place, W.C.1. The file number is 356,937.

Widnes Stearine Company, Ltd. (356,823).—Private company. Capital, £2,500 in 2,500 shares of £1 each. To acquire three leasehold plots of land at or near West Bank Dock, Widnes, together with the buildings thereon known as The Ditton Oil Mills, and to carry on the business of oil and grease manufacturers, refiners and blenders, wholesale and retail oil, grease, fat and chemical merchants, etc. Directors: Timothy Monaghan, 140 Kingsway, Widnes; Mrs. Mary E. Monaghan, Thomas Monaghan. Registered office: West Bank Dock, Widnes.

East Anglia Chemical Company, Ltd. (356,776).—Private company. Capital, £2,000 in 2,000 shares of £1 each. To carry on the business of manufacturers of and dealers in chemical, industrial and other preparations and articles, mixtures, compounds and lubricants, cellulose, shellac and other lacquers, cellulose, oil-bound and other paints, varnishes, oils, pigments, printing and other inks, etc. Directors: John F. Hathorn, 18 Berkeley Street, W.1; Thomas C. Usher, George A. Jenkins. Solicitors: George A. Herbert, 10 Old Square, Lincoln's Inn, W.C.2. Registered office: Walmer Road, South Lowestoft.

Chemical Trade Inquiries

South Africa.—His Majesty's Trade Commissioner at Johannesburg reports that the South African Railways and Harbours Administration is calling for tenders (Tender Number 2389) for the supply and delivery of approximately 37,900 gallons of disinfectant fluid. Tenders endorsed "Tender Number 2389 for disinfectant fluid" should be addressed to the Chief Stores Superintendent, South African Railways, Room No. 8, Park Station Chambers, Johannesburg, by whom they will be received up to 3 p.m. on November 20, 1939. Tenderers must submit a sample of not less than one gallon of the fluid to be supplied to the Government Pathologist, Government Bacteriological Laboratory, Cape Town, by not later than the closing date for receipt of tenders. Copies of the schedule and general conditions of tender are now available for loan. Local representation is essential. All telephonic communications with the Department of Overseas Trade in regard to this tender should be addressed exclusively to Whitehall 9040, Ext. 253.

Chemical and Allied Stocks and Shares

THE further rise in Government securities maintained a firm undertone in the stock and share markets, although the volume of business was small and again showed little, if any, improvement. In sympathy with the general market tendency the majority of movements in shares of chemical and kindred companies were to slightly higher levels. There were few sellers, and in the circumstances the tendency was for prices to respond readily to moderate demand.

* * * *

Imperial Chemical were 30s. compared with 29s. 3d. a week ago, while the company's preference units improved 9d. to 29s. Borax Consolidated at 26s. 10½d. gained 7½d. as compared with a week ago, while Imperial Smelting moved up a few pence to 11s. 3d. aided by the view expressed at the meeting that the outstanding preference dividend arrears should be cleared next year. The market is also inclined to assume that a year hence the ordinary shares may have re-entered the dividend list with a small payment. Fison Packard were 36s. awaiting publication of the results, but were inactive, as were B. Laporte, which continued to be quoted around 56s. 3d. Distillers were active following the price being sent out "ex" the scrip bonus, and subsequently changed hands around 65s. 9d. On balance, Lever & Unilever were 1s. better at 29s. 9d. pending the interim dividend decision, which is due shortly. Reports of improved activity in the textile trades drew some attention to Bleachers at around 3s. 3d. and also to Bradford Dyers around 4s. 6d., while Courtaulds were 29s. British Celanese showed firmness at 6s. 3d. while the first preference were higher at 19s., aided by hopes of a further payment on account of dividend arrears later in the year; the second preference, on which there are substantial arrears outstanding, were 14s. 9d. General Refractories attracted some attention and were slightly better at 8s. 6d.

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British Match were a steady feature at 31s. 6d. while Michael Nairn remained at 56s. 3d. Barry & Staines were 1s. 3d. better at 25s. British Oil & Cake Mills at 36s. 3d. were unchanged, while United Premier Oil & Cake held last week's improvement to 7s. 6d. although the price is now "ex" the interim dividend. British Glues 4s. shares were quoted around 5s. and William Blythe 3s. ordinary were around 6s. Burt Boulton & Haywood were lower at 15s. 7½d., due partly to the deduction of the dividend from the price. Monsanto Chemicals 5½ per cent. preference were 20s. and Greeff-Chemicals Holdings 5s. shares kept around par, although now "ex" the interim dividend. Triplex Glass remained dull at 23s. 9d. On the other hand, Dunlop Rubber, British Oxygen, Turner & Newall, Tube Investments, Pressed Steel and Murex were among shares which were inclined to make better prices in sympathy with the prevailing tendency in the stock and share markets.

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Oil shares were lower on balance, under the influence of the reduction in Trinidad Leaseholds' dividend to 15 per cent., due to the large sum set aside for taxation. "Shell" have declined on the week from 86s. 3d. to 84s. 4½d. Anglo-Iranian were 61s. 3d. awaiting the interim dividend announcement. Elsewhere Associated Cement were better at 69s. 4½d., while Tunnel Cement improved to 38s. 1½d. and British Plaster Board were a firmer market at 23s. 6d. The tendency in iron and steel shares was somewhat irregular, but Stanton were firm and Staveley improved to 42s. 6d. Dorman Long were lower at 22s. 3d., the disposition being to await the results due next month.

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In other directions, Boots Drug were more active around 41s. 6d., while Timothy Whites were 21s. and Sangers 17s. 9d. British Drug Houses were again 21s. 3d., but the price did not appear to be tested by business. Newton Chambers were lowered 1s. 6d. to 39s. at Sheffield.